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VACCINE THERAPY IN SOME SUPPURATIONS OF THE NOSE AND EAR; ALSO TECHNIC FOR DETERMINING OPSONIC INDICES.*

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THE TECHNIC OF DETERMINING OPSONIC INDICES.

The facts and theories upon which opsonic treatment is based are as follows:

1. Bacteria infecting the body are attacked by leucocytes which ingest them.

2. The number of bacteria which can be ingested is of varying quantity.

3. The number of bacteria which can be ingested depends upon their preparation by substances present in the plasma of the blood known as opsonins.

The exact nature of opsonins is not known, but it is known that they are not identical with the agglutinins, antitoxins, etc., which are also found in the plasma. Their action is not on the leucocytes, but on the bacteria which, as stated, they prepare for ingestion. Opsonins are present in normal blood as well as in the blood of infected individuals. The opsonic strength of normal blood is practically constant, but varies slightly with the individual, and general health, nutrition, etc.

The opsonic strength of an infected individual is lower than that of a normal individual, consequently his blood can prepare fewer bacteria and fewer will be ingested by the leucocytes. The relation between the number of bacteria ingested by the leucocytes of the infected person to the number of bacteria ingested by the leucocytes of a healthy individual, gives us a value which we call "the opsonic index." For instance, if ten bacteria are ingested on the average

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by the leucocytes of a healthy person, and five of the same bacteria by the leucocytes from an infected person, the opsonic index of the latter would be .5.

The opsonic index of an infected person may be increased by injecting into him killed cultures of his infecting organisms. For instance, if an infection is due to the staphylococcus albus, some of these particular germs are taken, grown on suitable culture media, and when sufficient quantity has been obtained, the culture is washed off with .85 per cent sodium chloride solution, to which a little carbolic acid has been added. The mixture, well shaken, is standardized to contain 300,000,000 cocci to the cubic cm., which represents one hypodermic dose. It is important to inject cultures made from the particular infecting organisms, because it is well known that even such well known organisms as the staphylococcus albus are subject to greater variation in virulence. Furthermore, this prevents errors in the diagnosis of the infecting germs.

I. METHOD OF DETERMINING OPSONIC INDICES.

In a small test-tube, place about two cubic cm. of a solution containing 1½ per cent of sodium citrate, and .85 per cent sodium chloride. Clean the finger with soap and water, followed by alcohol; prick the finger, and allow fifteen drops of blood to flow into the solution in the test-tube, mixing well. The sodium citrate prevents coagulation of the blood. The test-tube is now taken to the centrifuge and centrifuged until all the solid particles of the blood are thrown down. The red blood corpuscles being the heavier, will form the lower layer, the leucocytes appearing as delicate, grayish film (known as "cream") on the surface of the reds. The supernated liquid has dissolved in it the plasma of the blood and is withdrawn by means of a delicate pipette, care being taken not to disturb the cream. The test-tube is then filled with .85 per cent sodium chloride solution, the corpuscles well shaken up, and the mixture again centrifuged. The corpuscles will then arrange themselves as before, and after withdrawing the supernated liquid, we will have freed them from the original plasma and the sodium citrate that was previously added. By means of special tubes, known as capsules, a quantity of blood is collected from the patient (capsule half-filled). Capsules of blood are similarly collected from several healthy individuals (two or three). The capsules are placed in the incubator at 37° C. for about five minutes, when the blood will be found to have coagulated. The capsules are then centrifuged, the

clot being thrown down, leaving the clear serum above. Meanwhile a suspension of the particular bacteria has been made by taking a loopful from the culture and mixing thoroughly with a quantity of .85 per cent salt solution, the amount of the solution being such that the mixture will be turbid, the turbidity to be judged only by experience.

We now have prepared: a. The cream consisting of washed leucocytes; b. a suspension of the infecting bacteria; c. serum from patients; d. serum from several normal individuals.

We now take a pipette with a long capillary stem. At a distance of about 5 millimeters from its tip, we make a mark with a blue pencil. We now draw from the cream sufficient to fill the stem up to the blue pencil mark. Then we remove the pipette from the cream, drawing the volume a little ways up to the stem so as to leave an air space. Then dip the same pipette into the suspension of bacteria of which we draw up an equal quantity. We leave another air space and draw up an equal quantity of serum from the patients' capsule. We now blow the contents of the pipette upon a glass plate and mix thoroughly by drawing up and blowing out several times. After mixing, the mixture is drawn well up into the stem of the pipette, the tip of the pipette sealed in a flame, the pipette marked on its bulb for identification and laid aside. We now take equal quantities of the sera from the capsules of blood collected from the normal individuals and mix them together in a little test-tube. This mixed serum is called "the pool." The object of mixing several sera rather than relying on one serum is to overcome fluctuations which are present in normal sera (fluctuating opsonic strength.) Another long-stemmed pipette is now taken, a distance marked off from its point as before, and equal quantities of cream, bacterial suspension, and pool serum taken and mixed, drawn up into the pipette, the end of the pipette sealed, its bulb marked for indentification, and laid aside.

It will be noticed that these two pipettes vary only in that one contains patient's serum in the mixture, while the other is made up with pool serum. The two pipettes are now taken, placed in the incubator at 37° C. for fifteen minutes. They are then removed from the incubator, the contents of each is separately blown on a glass plate, drawn back and forth several times to insure mixture (this second mixing is required because the corpuscles tend to settle during incubation), and now a drop of the mixture is blown onto the

end of a perfectly clean glass microscopical slide, and the drop spreads evenly over the slide. At least three slides (two to be held in reserve for accidents) should be made from each pipette. The slides are now stained with Nocht's stain and examined with the microscope. The number of bacteria in each of fifty leucocytes is counted on each side. As before stated, the relation between the number of bacteria ingested by the leucocytes on the patient's slides compared with the number ingested by leucocytes obtained from the control slides, gives us the opsonic index. As will be noticed, the serum was the only variable factor in the preparation of these slides, therefore the variation in the number of bacteria ingested must be due to this difference of sera, and the substance in the sera which is responsible for this variation is "opsonin."

II. PREPARATION OF VACCINE.

A culture of the specific germs is washed off with salt solution and carbolic acid as before stated, standardized, placed in homeopathic phial (number for staphylococci being 300,000,000, other organisms requiring a strength of from 50,000,000 up) subjected to a temperature of 60° C. for a half to one hour in order to kill the organisms, a higher temperature to be avoided so as not to interfere with the chemical action of the bacterial ferments.

A control culture is made from the vaccine, and in certain cases also guinea pig inoculations to insure sterility of the vaccine, especially the absence of tetanus must be insured.

REPORT OF CASES.

The total number of cases that I have treated by this method are eleven, which are as follows:

2 Unilateral sinusitis of the staphylococcus variety of infection, of a chronic type.

1 Polysinusitis, chronic, of a staphylococcus aurius, pseudo-diphtheria bacillus.

1 Chronic antral infection, unilateral of dental origin, staphylococcus infection.

2 Subacute unilateral sinusitis (most probably confined to the frontal sinus.) Staphyloccus pyogenes aureus.

2 Chronic purulent otitis media of a double infection; viz., staphylococcus and pneumococcus (bilateral).

1 Chronic purulent otitis, radical mastoid, Friedlander bacillus infection.

1 Chronic purulent otitis, unilateral, ossiculectomy, diphtheria infection.

1 Acute otitis media purulenta bilateralis diphtheria-like bacillus infection, following a violent grip attack.

All these cases had, previously to the vaccination treatment (autogonous), the usual accepted method of treatment without the desired results. All of them were subjected to the opsonic index which was lower than the normal; one as low as 0.3 and the nearest to the normal was 0.76. In all but one case, and that was the chronic bilateral sinus infection in which more than one index was taken, I depended almost exclusively on the clinical manifestations as an index and used the average time of ten days between the times of vaccination. Complete records were kept on the observations such as reaction and other symptoms and will be published in detail in a subsequent paper. Suffice it to say at this time that without exception there is a distinct improvement and some of the cases are cured, although not long enough time has elapsed in the chronic cases to be absolutely certain. My purpose in bringing this subject before you is not to come with any positive conclusions because in the first place it requires a great number of cases of various pathological conditions and a much longer time to observe before one can make positive statements, but, to encourage if I can, some of you to take up this line of work if you are not already doing it, and in a symposium, report our results. So far as complications or accidents are concerned in this treatment, I must say that not in one case was there a single bad result and only one that gave me any thought and anxiety, and that was the following:

In the case of subacute unilateral sinus disease of staphyloccus pyogenous aureus infection, at the second injection into his left arm, there followed what clinically one would diagnose as an erysipelas with marked infiltration from the point of innoculation above the elbow, down to the finger tips, but absolutely no general symptoms. The patient felt as well as he ever did, and there was no infection of the axillary glands. Most of the cases showed slight general disturbances for from an hour to four hours after the vaccination, such as nausea, malaise and slight headache, and occasionally a slight rise of temperature.

The specific technic of vaccination is as follows: Scrub up thoroughly the part where the injection is made, either the arm or interscapular region, and under strictly aseptic precautions, draw up into a hypodermic syringe the dose prescribed, usually one cubic centimeter of the vaccine, and inject subcutaneously, seal up the puncture with collodion. As said above, about ten days are allowed to

elapse, when a second vaccination is made and so often repeated in those intervals until the patient is cured. If one should observe that a patient reacts badly and becomes markedly depressed after the injection, it is necessary to prolong the interval.

In conclusion, I wish to say that at the present time I have the following cases under treatment, but not sufficient length of time has elapsed for me to even report any partial results. Three cases of chronic nasopharyngitis, all staphylococcus infection (mild).

Two cases chronic tubercular laryngitis (ulcerated).

Four chronic purulent otitis media bilateral, in tubercular individuals, in which a positive ophthalmic reaction was obtained.

Two cases of atrophic rhinitis in tubercular subjects, one in non-tubercular subject.

All these tubercular patients are treated by tuberculin injections instead of the autovaccine.

The laboratory work of determining opsonic indices and making the vaccines are at present done for me by the *Columbus Medical Laboratory* and the *Chicago Laboratory*.

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A CASE OF LABYRINTHINE DEAFNESS WITH "TONE ISLAND."*

BY GEO. E. SHAMBAUGH, M. D., CHICAGO.

Mr. W., 25 years old, a student. No history of deafness in either his father's or mother's family, is obtainable. The patient has one brother a few years older than himself, who, for a number of years has suffered from ear trouble similar to his own. An examination of this man's hearing gave the reactions characteristic of partial loss of hearing due to involvement of the nerve apparatus.

The patient had no serious illness as a child excepting measles, and perhaps pertussis. He has had no previous ear trouble. He first began to detect defective hearing while he was attending the high school at the age of 19. At this time he did not suffer from tinnitus aurium.

In July and August, 1906, he had typhoid fever. About two months after getting out of bed he began to detect tinnitus aurium in the right ear. This has remained constant ever since. Later tinnitus also began to be noticed in the left ear, where it has appeared to be intermittent. The character of the tinnitus in both ears is that of a high-pitched cricket-like sound.

There has been no dizziness nor other symptoms referable to the ears.

The membrana tympani in both ears is normal.

The functional examination gives the following: *Whispered voice.* Right ear "82" heard at two inches from ear, "66" not heard at all. Left ear "18" heard at four inches from ear, "66" is not heard. In the *Weber test* the "A" fork is indistinctly lateralized in the left ear, but appears to be heard in both ears. In the *Schwabach test* the duration of bone conduction for the "A" fork is normal. The *Rinné reaction* for the "a" fork is positive in both ears.

In testing the several parts of the scale by means of the Bezold-Edelmann continuous series of tuning forks the following conditions were found: In the right ear the patient heard all tones of the scale up to f^3. From this tone to the upper limit there is complete loss of hearing. In the left ear he hears all tones from the lowest fork, 16 d. v. per second up to f^4. From f^4 to a^4 there is in this ear complete defect in hearing. From a^4 to e^5 he hears all the

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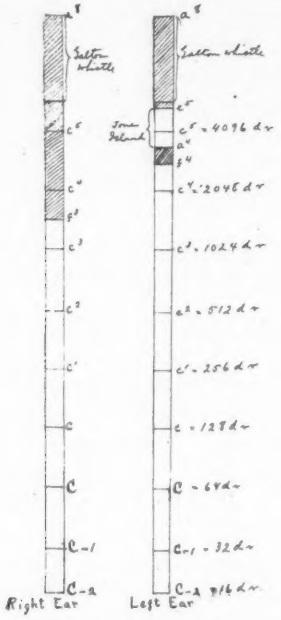
tones. Above e^5 to the upper limit there is again a complete defect in the hearing. We have in the left ear from a^4 to e^5 an example of a so-called "island of hearing," or "tone island," also an example of a circumscribed defect in the midst of the scale from f^4 to a^4.

Circumscribed defects in the scale are by no means uncommon. A loss of hearing for the tones at the lower end of the scale is associated with almost every case of middle ear disease, and is caused



apparently by a more or less rigidity of the sound conducting mechanism, that is of the membrana tympani, and the chain of ossicles, but especially upon a fixation in the oval window of the stapes which must be looked upon as the key to the sound conducting mechanism.

Defects circumscribed to the upper end of the scale are also quite common. Such defects, as well as circumscribed defects in the middle of the scale and the existence of islands of hearing as found in the left ear of this case must be looked upon as the result of disease located in the cochlea. The possibility that such circumscribed defects in the scale are due to disease in the brain centers of the cortex seems highly improbable. The reason for which we need not discuss here.

The great interest which a case such as this possesses is the light which it throws on the problem of tone perception. The faculty which the organ of hearing possesses of recognizing the correct pitch of tones, and at the same time of analyzing into their several elements the complex tones which impinge on the ear at one time, lead Helmholtz to construct his resonator theory of tone perception to explain these phenomena. One of the fundamental hypotheses of the Helmholtz theory is that groups of end-organs in the several parts of the cochlea have to do each with the perception of particular tones, the lower tones being taken up by the hair cells located near the apex of the cochlea, the higher tones by those in the basal coil. The second fundamental hypothesis of his theory is that there exists in the cochlea a mechanism which acts as a physical resonator, responding in one part to tones of a certain pitch, and in another part to tones of a different pitch. It is the mechanical action of these physical resonators responding to tones of different pitch in the several parts of the cochlear tube that brings stimulation to this or that group of hair cells, and leads to the perception of this or that particular tone.

Objections to the Helmholtz theory have arisen, and since his time a number of new theories have been suggested to explain the interesting phenomena of hearing. However, with the knowledge which we have of the various phenomena associated with tone perception, physiologists are, for the most part, convinced that we can hardly escape accepting the theory that a resonator in some form exists in the cochlea. On the other hand, the clinical phenomenon presented by these cases where "tone islands" are found is one of the strongest proofs of the hypothesis that perception for the several tones takes place in separate and distinct parts of the cochlear tube.

I believe I have been able to demonstrate that the particular structure in the cochlea which Helmholtz fixed upon as the mechanical resonator, viz., the radiating fibers of the basilar membrane, is not the vibrating structure which it was supposed to be by Helmholtz. This discovery does not, however, overthrow the fundamental principles of the resonator theory as laid down by Helmholtz. I have attempted to show that the membrana tectoria, and not the basilar membrane, is the logical structure for stimulating the hair cells. This is the structure which apparently fills the role of physical resonator by responding in its various parts to tones of different pitch. I have shown that the tectorial membrane va-

ries enormously in size from one end of the cochlea to the other. This variation in size, together with its fibrillar structure, are characteristics which suggest the probable physical basis which render it possible for this structure to act the part of physical resonator by responding in one part to impulses of a certain pitch, and in another part to impulses of a different pitch.[1]

The human ear is capable of hearing tones at least as low as 16 d. v. per second, and tones as high as 55000 d. v. per second. With the conception that the perception of the lowest tones takes place at the apex of the cochlea, and that the tones higher and higher in the scale are taken up successively by groups of hair cells located nearer and nearer the base of the cochlea we can readily account for the phenomena as presented by this case, where we find the circumscribed preservation of hearing for a certain part of the scale in the midst of a more or less extensive complete destruction of hearing for neighboring tones. We have simply to imagine that we have spread out from one end of the cochlea to the other a mechanism not unlike a piano-forte, each particular part responding to a tone of a particular pitch. A disease process invading the cochlea, such as the formation of a blood clot, the invasion of pus, as in cerebro-spinal meningitis, or from an otitis media, or a nerve degeneration, may destroy the end organs over a certain part of the cochlea, and leave the remainder untouched. The result would be exactly what we have in this case, the preservation of so-called "tone islands."

Just what the process is in this particular case that has invaded the cochlea we can only surmise. The fact that the process has been an insidious one, and began before the age of 20, when taken with the fact that a brother has developed the same type of deafness coming on in exactly the same way suggests the possibility that this may be due to the condition known as otosclerosis. The spongifying of the capsule involving the basal coil in both cases, but without extending to the footplate of the stapes.

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OBSERVATIONS ON THE TEMPORAL BONE.*

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The study of the surgical anatomy of the temporal bone is always interesting. There has appeared from time to time much literature on this subject, with many recorded observations, notwithstanding which there still exists considerable diversity of opinion not only as to the exact status of some of the more important points in the anatomy of this bone, but also as to the surgery of the mastoid process.

The constancy of certain familiar landmarks, the size and position of the several parts of the temporal bone and their relation to neighboring organs of importance are to my mind of sufficient interest to warrant the report of my findings from the examination of material upon which the work of this paper is based.

I. MATERIAL.

The material upon which the observations quoted in this paper are based consisted in the examination on the cadaver of 463 adult temporal bones. Of this number 249 were males and 214 females. In age they ranged from 19 to 79 years.

II. VARIATION OF CONTOUR.

The study of the comparison of the fully developed mastoid process in different adult individuals presents such variation in contour and structure as to make it impossible to establish a definite description as to the exact exterior and interior of a mastoid process. There exists no bone in the human body which presents so many deviations, both externally and internally, as does the normal mastoid process of the temporal bone.

Outwardly the mastoid process may be flattened or round in contour. The tip may be vertical, oblique or curved. The outer surface may be smooth and hard, or it may present irregularities and numerous openings for the passage of blood vessels. The cortex may be exceedingly thin, not more than .5 mm. in thickness, or it may be as thick as 10 mm. Certain limited areas may be thin and the surrounding areas thick. The same multiplicity of variations as noted in the examination of the exterior is found in the examination of the interior.

* Read before the Thirteenth Annual Meeting of the American Laryngological, Rhinological and Otological Society, New York City, May 30, 31, and June 1, 1907.

Apart from the variations due to the development of the bone from infancy to adolescence, certain other conditions no doubt influence the character of the contour of the mastoid process and its interior, and while it cannot be said with any degree of certainty as to what will be the character of a mastoid process from its external appearance, yet it can with reasonable assurance be assumed that the mastoid process of a well developed and muscular man will be of large size, with prominent surface markings, and a spacious interior.

The dolichocephalic skull will present a larger mastoid process than a brachycephalic skull, a male a larger process than a female, and likewise a muscular man a larger and better developed mastoid process than a non-muscular man.

Since, therefore, we have large broad processes and small narrow ones, we are justified in supposing that when the process is large the essential structures contained within it will be separated from each other much more than when the process is small, when the structures must necessarily be in closer apposition in the more confined space.

The arrangement of the cellular tissue of the mastoid process is also subject to vagaries of structure.

III. SYMMETRY.

The symmetry of the two mastoid processes in an individual is at times important from a surgical point of view. In the examination of 119 crania for determining asymmetry of these processes, I found the mastoids decidedly asymmetrical 9 times, or 7.5 per cent of cases examined. Blake,[1] in an examination of 300 crania with reference to asymmetry found that 10, or 3 1-3 per cent, had markedly asymmetric mastoid processes.

In a general way, it may be said that the mastoid process is conoidal in form, with a direction downward and slightly forward. Contrary to the claims made in most text-books that the anterior wall is distinctly vertical, the anterior wall may be vertical or may incline obliquely forward, or the tip may be curved in a forward direction. My observations showed the anterior wall vertical in 69 per cent of cases examined, inclined obliquely forward in 26 per cent, and curved forward in 5 per cent.

The posterior border inclines downward and forward at an angle of about 45 degrees.

IV. SURGICAL LANDMARKS.

On the external surface of the mastoid process are noticed several landmarks of surgical importance, the suprameatal spine or spine of Henle, the suprameatal or supramastoid fossa, the remains of the squamo-mastoid suture and the mastoid foramen.

Of the three portions of the temporal bone, the squamous and petrous portions enter into the formation of the mastoid process; the squamous above and in front, and the petrous behind and below. The junction of these two parts form the squamo-mastoid suture. This suture situated on the outer aspect of the mastoid process runs from the parietal notch downward and forward to a point behind and below the external auditory meatus, external to the styloid process.

I have found it present as an open suture 9 times, and the remains of the suture evidenced 74 times, or 16 per cent.

This squamo-mastoid suture belongs more properly to the infant bone, though frequently it persists until puberty and in some cases remains permanently unossified. In adult life usually some traces of it remain and it is recognized during operation by the firm adherence to it of the overlying periosteum, which, when elevated, leaves a white line of shreds upon the surface of the bone. MacEwen[2] reports finding the suture open, in adults, 6 times during operation. (I observed this condition twice on adults, during operation.)

The suprameatal spine of Henle from the reliance placed upon it by many otologists as an infallible guide when operating, makes it one of the most important landmarks when present.

The spine varying considerably in size and prominence has nearly always the same relative position. It is a more or less prominent projection of bone situated above and behind the posterior-superior quadrant of the external auditory meatus, curved concentrically to the circumference of the meatus, with its upper portion slightly anterior to the lower portion. In size, it may be large or small. It may project prominently, or it may be flattened in appearance, or it may be entirely absent, or so slightly developed as to be overlooked, and can only be recognized by an experienced eye or felt by the finger. Usually its development is in ratio to the development of the balance of the surface markings of the temporal bone.

It is not constant. This differs from the views formerly held by most otologists, but at present there still exists differences of

opinion as to just how often its absence may be noted. Yearsley[2] in the examination of 2,000 temporal bones found the spine absent 160 times, or 8 per cent. In addition, he found the spine very poorly marked in 12.57 per cent, being recognized only by the trained eye and finger. Broca[4] states that Kiesselbach noted its absence 18 times in 100 temporal bones which he examined; Schultze, 11 times in 120, and Lenoir, once in 200. My results of the examination of 463 temporal bones gives it absent 56 times, or 12 per cent. It was barely demonstrable in 41 other specimens.

When present, the suprameatal spine is a valuable landmark, and can be depended upon to furnish an excellent guide for entering the mastoid antrum, but, since the observations given above show its absence 246 times in 2,883 cases, or 8.5 per cent, too much stress must not be placed upon this as a landmark when operating.

The relation of the spine to the floor of the middle cerebral fossa showed the average distance between its upper part and the floor to be 6 mm. In one instance the floor was as low as the spine. Randall,[5] in the examination of 1,000 skulls, found it as low as the spine in but 5 cases.

Lying immediately behind the suprameatal spine is a depression called the suprameatal fossa . This landmark is more constant than the spine, therefore more useful as a guide. It represents the adult condition of the spongy spot seen in the infant, up to the second year of life. It is the external boundary of the antrum. In the infant its position varies with the position of the antrum, but in the adult its position is constant.

It may be a large excavated depression triangular or crescentric in shape, or it may be a mere chink or slit, or it presents as several large vascular foramina or many small ones. Yearsley[3] reports the finding of this fossa in every specimen of the 2,000 temporal bones which he examined. The results of my observations showed the absence of a fossa 36 times, or 7.7 per cent, of the specimens examined. However, in each of the 36 bones which failed to show a suprameatal fossa there were to be noticed two or more small foramina situated immediately behind the spine where the fossa should have been.

The result of my not considering these foramina as fossæ will no doubt account for the difference in the findings of Yearsley and myself.

In some cases where large foramina were present, the mucous membrane lining the underlying cells was in direct contact with

the overlying periosteum which was evidenced by the adhesion between them. In one instance a foramen of unusual size was noted. It lead directly to the mastoid antrum. It was ovoid in shape measuring 4 mm. in its long diameter and 3 mm. in its short diameter.

The mastoid foramen is the opening on the cortex through which passes the mastoid emissary vein entering the lateral sinus at its descending or sigmoid portion. This opening may be single or double. It may be small, giving exit to a vessel of minute size, or it may be large so that the vessel emerging from it may be a sinus carrying all the blood to the external jugular vein. The bony opening may lead directly through the cortex to the sinus groove, or it may run between the outer and inner tables for a distance of as much as 15 mm. When this latter condition is present the outer opening is placed correspondingly far back. The position of the mastoid foramen varies in both a horizontal and vertical plane. Its usual location is 30 mm. behind the external meatus, and 30 mm. above the inferior end of the mastoid tip.

The linea temporalis, or temporal or supramastoid ridge, is a backward and upward prolongation of the posterior root of the zygoma. It is more or less prominent in different subjects, but it is always appreciable even in the child. Its position is almost invariably a little below the floor of the middle cerebral fossa, though in the examinations which I made to determine this I found the floor of the fossa below this line 6 times in 463 observations. This condition occurred in brachycephalic skulls.

On the inner side of the mastoid tip is the incisura mastoidea or digastric fossa, for the attachment of the digastric muscle. This fossa may be shallow or deep and occasionally its upper part is dehiscent. The absence of the superior wall was noted by me 3 times.

V. CELLULAR STRUCTURE.

The cellular structure of the mastoid process differs as to the number, size and character of the cells. According to the general character of the cells, a mastoid process may be called pneumatic, diploic, mixed or eburnated. According to Zuckerkandel,[6] in 36.8 per cent of the cases examined by him, the mastoid consisted, from its upper to its lower boundary, of larger or smaller pneumatic cells; in 43.2 per cent it was formed, chiefly in its lower and posterior portion, of diploic and osseous substances; while the anterior-

superior part contained pneumatic cells; in 20 per cent the mastoid was wholly made up of diploic, less frequently of sclerotic tissue.

The results of my observations show the purely pneumatic type of mastoid process to predominate, there being 44.2 per cent; the mixed variety, diploic below the pneumatic above, being 37.1 per cent; and the diploic type 1.86 per cent. It will be noted that in these figures no reference has been made to sclerosed processes, for the reason that this condition is undoubtedly always pathological and where a process was sclerotic the observation was not recorded. Randall[5] states that he does not believe any mastoid process to consist of purely pneumatic spaces.

The cellular structure is arranged as follows: It is divided into two parts; the mastoid antrum and the surrounding cells, all of which communicate with the antrum.

The antrum is the most important of the air spaces in the mastoid process. It is constant in its presence and nearly always so in its position. It may be large or small, according to the size of the mastoid process, or it may be diminished in size by reason of osteosclerosis.

I have always found it constant, notwithstanding the claim of some observers of their inability to find it. Whiting[7] has never failed to note it in over 800 cases.

The antrum does not contain compact bony walls, they being cellular in character. The size, while uniform, may be influenced by the nature of the mastoid structure. When the surrounding bone is pneumatic the antrum is usually large, but when the surrounding bone is diploic or dense the antrum is apt to be smaller.

The average height of the antrum was found to be from 12 to 15 mm., its width about 7 mm., and its breadth 8 to 10 mm.

The roof or tegmen antri is a thin plate of bone about 1 mm. in thickness, situated externally to the prominence formed by the superior semicircular canal, and is from 3 to 6 mm. higher on a horizontal plane than the upper margin of the external bony canal. It is continuous with the tegmen covering the tympanum and aditus and separates the antrum from the middle cerebral fossa. It frequently contains numerous foramina for the passage of small blood vessels. At times it has a distinctly cribiform appearance. It may be wholly or partially absorbed in old age. Burkner, as quoted by Politzer,[8] observed a dehiscence in the tegmen 167 times in a study of 765 cases. I have noted this condition 21 times.

The anterior wall may be thin, with an occasional dehiscence at its superior part so that the aditus in its vertical diameter may be as large as that of the antrum. When this does occur the facial nerve lies uncovered with bone, where the nerve turns to descend in its vertical course. This condition occurred twice in my observations.

The anterior wall separates the mastoid antrum from the bony portion of the external auditory meatus.

The posterior wall is seldom a wall, but rather a set of cells lying between it and the bony covering of the lateral sinus. These cells, which are frequently of large size, have been called by some authors the accessory antrum, but they are in reality the posterior superior cells.

The outer wall is formed by the descending plate of the squamous portion of the temporal bone. This wall may be as thin as 5 mm. or as thick as 20 mm. The average depth of the antrum from the surface of the bone is from 12 to 15 mm.

The depth differs from an age point as well as in different individuals of the same age.

The importance of the depth of the antrum lies in determining just how far one may enter with safety when operating upon the mastoid, in an attempt to reach the mastoid antrum.

Observers differ as to what is considered a safe distance to enter when attempting to reach this cavity. Politzer[8] gives his limit of safety from 5 to 6 mm., while Schwartze[9] places his at 25 mm. The distance of the outermost part of the mastoid antrum to the external surface of the mastoid process is a much mooted point. Many observations have been made along this line with a resultant difference of opinion. (It is an exceedingly important question, since an operator feels the necessity of an approximate idea as to the depth of the antrum and to what distance he can chisel without overstepping the limit of safety.)

For the proper estimation of the depth of the antrum, some fixed and definite point should be selected from which measurement should be taken. For this purpose the base of the supra-meatal spine has been generally accepted as a proper point.

I found, in my examination, that the thickness of the cortex from the outermost part of the antrum to the base of the supra-meatal spine was as follows:

Depth in mm.	Number of bones.
5	2
6	5
7	11
8	16
9	26
10	39
11	43
12	57
13	64
14	59
15	42
16	34
17	23
18	16
19	12
20	7
21	4
22	2
23	1
	463

It will be noted from these figures that the thickness of bone varies from 5 mm. to 23 mm., and that the average distance was 13.1 mm. Kerrison,[10] in a study of 30 temporal bones, measured the thickness of osseous tissue separating the antrum from the cortex and found that from the spine of Henle the depth varied from 6 mm. to 15 mm., with an average depth of 10.9 mm.

The character of this intervening osseous tissue may be dense, densely cellular or coarsely cellular. It was found to be dense in 251 bones, densely cellular in 8, and coarsely cellular in 124.

During the examination to determine the depth of the antrum, measurements were also made of the posterior-superior bony canal wall for the purpose of noting the relation of the depth of the antrum, to the length of the bony wall. The following measurements were taken:

Depth in mm.	Number of specimens.
9	2
10	7
11	18
12	31
13	50
14	56
15	69
16	73
17	54
18	36
19	27
20	16
21	10
22	8
23	4
24	2
	463

The average length of the bony canal was found to be 15.6 mm. In no specimen was the depth of the antrum greater than the length of the bony wall.

The cells in the mastoid process can for the purpose of convenience be designated by names according to the part of the temporal bone in which they are situated. We may have, therefore, squamous cells, zygomatic cells, tip cells, posterior tip cells, posterior superior cells and internal petrous cells.

Many authors have classified these cells into mastoid cells, petrous cells, squamous cells and zygomatic cells. The mastoid cells include those lying below a horizontal line passing through the center of the external auditory meatus. The petrous cells include those cells which occupy the base of the petrous portion of the temporal bone and are situated above a horizontal line dividing the external auditory meatus at its center. Behind they extend to the lateral sinus, anteriorly they are limited by the premastoid lamina. The squamous cells are situated in the part of the temporal bone which contributes to the formation of the posterior wall of the external auditory meatus. The zygomatic cells are usually included under the name of squamous cells and are to be found in contact with the meatus and bordering it, being prolonged occasionally above the meatus and in front of it into the root of the zygoma above the articulation of the jaw.

It has been my practice to designate these cells only as squamous cells which lie between the outer and inner tables of the squamous portion of the temporal bone. The tip cells, as their name indicates, are found in the tip of the mastoid process. These are usually the largest of the pneumatic cells. At times a single cell will occupy the entire tip. The posterior tip cells lie along the posterior border of the tip behind the lateral sinus. They, too, are frequently of large size. Their removal always exposes the digastric muscle. A set of cells lying between the antrum and the knee of the sinus have been called the posterior superior cells. The internal petrous or deep petrous cells are seldom large but occupy that part of the mastoid process between the antrum and the tip cells, internal to the incisura mastoidea. The zygomatic cells are those lying above and in front of the meatus beneath the ridge at the posterior root of the zygoma, above the articulation of the jaw.

The aditus ad antrum is the connecting channel or canal which joins the antrum to the tympanum. It has an average length of

from 3 to 5 mm., is from 3 to 4 mm. high, and is about 3 or 4 mm. deep.

The direction of the aditus changes from child-life to adult-life according to the position of the antrum. Its position is almost horizontal, placed directly opposite to the tympanic orifice of the Eustachian tube, but on a higher level. On the outer wall there is more or less cellular structure. Its upper wall or roof is the tegmen of the aditus continuous in front with the tympanic tegmen and in back with the tegmen of the antrum. This thin plate of bone is, as in the case of the tegmen of the antrum or tympanum occasionally dehiscent. Its anterior end opens on the horizontal portion of the Fallopian canal. The external or horizontal semi-circular canal projects from its inner wall. Cells are frequently seen on the floor and inner wall.

The middle ear or tympanum is a small irregular air chamber situated in the petrous portion of the temporal bone. It is interposed between the external auditory meatus and internal ear. Its long axis is antero-posterior and measures from 12 to 13 mm. Its depth 2 to 4 mm., being narrower at the center of the drum. Its vertical diameter is about 13 to 14 mm., which includes the attic.

The attic, or, more properly, the recessus epitympanicus, is the highest portion of the tympanic cavity. It contains the head of the malleus and the body of the incus. It leads into the antrum by means of the aditus. The roof or tegmen tympani is a thin plate of bone continuous with the tegmen of the aditus. It separates the tympanum from the cranial cavity. In children under one year of age there is present the remains of the petro-squamosal suture. This suture may be present, in the adult, in its entirety, or remains of it recognized. When this suture exists the mucous membrane lining the tympanum is in direct contact with the dura mater. This suture was present in 12 of the ears which I examined. Cheatle[11] noted this suture 21 times in 210 temporal bones. Quite frequently a bony ridge can be noticed extending antero-posteriorly. This marks the position of the former suture.

The floor of the tympanum is also called recessus hypotympanicus. This bony plate is of variable thickness and separates the tympanic cavity from the jugular fossa. Normally there is a small foramen in the floor for the passage of a branch of the pneumogastric nerve. The floor may be partially or wholly dehiscent and when this does

exist the dome of the jugular bulb presents in the tympanic cavity. This dehiscence is of very frequent occurrence in children and probably occurs in adults with much more frequency than is ordinarily supposed. I have noted this dehiscence in the adult 29 times, being complete 14 times. Koerner,[12] in an examination of 449 cases found a dehiscence in the floor of the tympanum 30 times. Gruber[13] reports the jugular bulb cut 5 times during paracentesis due to a dehiscence in the tympanic floor.

The anterior wall is quite narrow and is deficient superiorly, inasmuch as the Eustachian tube opens into the tympanum in this situation. The orifice of the Eustachian tube is about 4 mm. above the floor. Just above the entrance is the canal for the tensor tympani muscle. Below the orifice of the Eustachian tube is a thin bony lamina situated between the tympanum and the carotid canal. This bony plate is frequently thin and even dehiscent, so that the carotid artery can be seen in the tympanic cavity. This condition I noted twice. In one instance this condition was seen by me, in the living. Lying in the floor of the bony Eustachian tube, at or near the tympanic end, are occasionally noticed some cells called cellulæ tubariæ. These cells are frequently the seat of disease and frequently are responsible for unhealed radical operations, the failure of which is usually attributed to a non-closure of the mouth of the Eustachian tube.

The posterior wall of the tympanum presents in its upper part the aditus ad antrum. Below this, on the posterior wall, is the pyramid, a cone-shaped projection which contains the stapedius muscle, the tendon of which passes through an opening at the summit of the pyramid. External to the pyramid is an opening called the iter chordæ posterius, through which the chorda tympani nerve passes. Lying on the inner wall of the tympanum are to be noted several points of importance, namely, the promontory, the oval window, the round window, the processus cochleariformis and the Fallopian canal.

VI. LATERAL SINUS.

The lateral sinus, the largest of the cranial sinuses, extends from the internal occipital protuberance to the jugular foramen, where it terminates in the internal jugular vein. The course is outward and then forward. It is divided into two parts, the horizontal and

sigmoid portions. The horizontal portion situated at the base of the tentorium cerebelli, is triangular on section, with the base of the triangle being directed outward. This portion grooves the occipital and parietal bones. The sigmoid portion is situated below the tentorium cerebelli and grooves the mastoid portion of the temporal bone and the jugular process of the occipital bone. It is semi-cylindrical on section. By some anatomists it is considered as a separate sinus.

The right sinus, usually larger than the left, begins at the torcular Herophili and is a continuation of the superior longitudinal sinus. The left is the continuation of the straight sinus. The superior petrosal sinus empties posteriorly into the sigmoid portion of the lateral sinus at its origin. The mastoid emissary vein entering the cranium through the mastoid foramen also empties into the sigmoid portion of the external sinus. Numerous small veins enter the sinus from the mastoid portion of the temporal bone.

The position of the sinus in the temporal bone is uncertain. It may encroach forward on the antrum or be situated well posteriorly. It may be sharply definded or shallow.

In brachycephalic skulls the sinus is supposed to be found well forward and superficial. In dolichocephalic skulls it is supposed to be placed well back and deeply seated.

These conditions may prevail in many cases, and while many observations have been made for the purpose of determining if possible the position of the sinus by external measurements, yet I am in accord with the findings of Koerner[14] and Randall,[15] who have concluded that no reliability can be placed upon external markings or measurements in determining the position of the sinus. Whiting[17] states that where the mastoid process is broad and flat, or long and pointed, the sinus is to be found far back from the meatus, and very deep beneath the cortex and diploic structure. When the mastoid process is round and narrow, or short and blunt, the sinus is situated close to the bony meatus and superficial with relation to the cortex and diploic structure.

The examination to determine the distance of the most protruding part of the lateral sinus to the suprameatal spine gave the average distance as 12 mm. The furthest away was 23 mm. Two specimens showed the sinus interposed between the antrum and the cortex. In one the sinus was in apposition to the posterior wall. The other was within 4 mm. of it.

The distance of the sinus from the spine of Henle is as follows:

Distance in mm.	No. of cases.
0	1
4	1
6	3
7	5
8	27
9	41
10	59
11	71
12	77
13	57
14	36
15	29
16	21
17	14
18	7
19	8
20	4
21	1
23	1
	463

Amberg,[16] as a result of the examination of 17 temporal bones, found the distance of the most prominent part of the lateral sinus from the spine of Henle to be from 6 mm. to 21 mm. He concludes that a sinus nearer than 10 mm. is displaced forward.

Ritter[17] reported a case in which the sinus touched the posterior meatal wall.

Berens[18] reported a case in which the sinus was displaced forward so that its anterior border was in contact with the posterior meatal wall, the sinus intervening between the cortex of the mastoid and the antrum.

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616 Madison Avenue.

A CASE OF PRIMARY EPITHELIOMA OF THE MAXILLARY ANTRUM.*

BY S. J. KOPETZKY, M. D., NEW YORK.

Mrs. L. P., aged twenty-nine years, came under observation in the summer of 1905, giving the following history:

Two years before her appearance she sustained an attack of influenza, following which she suffered from pain of a neuralgic character over the right cheek, often extending to the right eye. These pains finally subsided without any special treatment, although she reported having continuously suffered from what she designated "nasal catarrh."

Of her family history, it is to be noted that her mother suffered from cancer of the breast, and a brother and sister had been affected with pulmonary tuberculosis.

The illness dated from five months prior to her coming under observation, when intense pains again reappeared over the right cheek radiating toward the right eye. The cheek had begun to swell three months previously.

Thinking that her trouble lay in her teeth, she applied to a dentist for treatment, and had a tooth removed from the socket of which a puncture was made into the maxillary antrum. A purulent discharge followed the puncture. The opening thus made evidently soon became occluded, because the puncture was repeated ten days later, and again after an interval of three weeks.

Each of these punctures seemed to afford an outlet for accumulated pus and were always followed by a temporary remission of the symptoms. During most of this time the patient complained of a purulent nasal discharge which occasionally was tinged with blood.

The swelling of the cheek varied in amount at different times, almost disappearing at intervals.

A few days before her examination, a sensation of numbness was experienced on the affected side, and she noticed an unevenness of her mouth when puckering her lips.

Examination showed the patient to have a slight facial paralysis and an inflammatory infiltrate of the soft tissues overlying the

*Read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, October 23, 1907.

maxillary antrum extending to the right eye, whose lids were somewhat infiltrated. Transillumination was positive on the diseased side, and intranasally, pus was demonstrable in the middle nasal meatus.

In view of the failure of conservative treatment, I suggested and the patient agreed to, an radical opening of the maxillary antrum, and the operation was performed under general anaesthesia at the St. Marks Hospital.

The antrum wall was laid bare by a T-shaped incision, which exposed a small fistulous opening in its wall about half an inch above the alveolar process from which the pus exuded into the soft cheek tissues.

The osseous wall of the antrum was removed easily, the bone being necrotic. The diseased bone extended upward toward the orbital floor. As much as possible of the diseased bone was eradicated. The interior of the antral cavity was found to be almost filled with pus, detritus, and soft polypoid degenerated mucous membrane. It is to be noted in passing that at this time no hard masses were found in the antral cavity. The pus gave off a foetid odor.

The cavity was packed with gauze (iodoform) after being cleaned, and the patient made an apparently uneventful recovery from the immediate effects of the operation.

Seventeen days later, under cocain anaesthesia, a sack of pus was located and cleaned out from the soft tissues of the inside of the cheek. This purulent track was then packed with gauze.

The swelling of the cheek persisted, however, and five days later, or twenty-three days after the first operation, grandular swelling appeared at the angle of the jaw, and the patient began to run some temperature.

I then consulted with Dr. Wendell C. Phillips, and upon his advice the patient again submitted to operation.

The old wound was opened, and to our surprise the antral cavity was now found to be more or less completely filled with rather hard, gritty masses, which extended into the bucal side of the cheek from the opened antral cavity. These were removed until no more could be located. A specimen submitted to Dr. Jonathan Wright, for microscopical diagnosis gave the following:

Microscopic Examination—This growth is distinguished by atypical epithelial proliferations in indistinctly outlined areas surrounded by fibrous tissue near the fibrous tissue the epithelial cells

are fairly well formed, but attain centers there are masses of degenerated hyaline and amorphous material faintly showing outlines of disintegrating epithelium, but not taking either the eosin or hematoxylin stain. The arrangement would suggest that this growth sprang from the grandular epithelium, but neither the arrangement nor the shape of the cells allow me to place definitely the origin of the growth either in the grandular or surface epithelium, but there appears to me no doubt of its malignant epithelial character.

The pain and the local symptoms subsided somewhat after this operation, although the facial paralysis persisted.

About a month later, a small inflammatory spot appeared externally on the face about one-half inch below the outer angle of the eye. This spot was surrounded by inflammatory inflatrate and the center broke down into a small ulcer. The cheek had meanwhile again become swollen. The patient was then sent to Dr. Aspinwall Judd for X-Ray applications to the ulcerated and infiltrated mass. This line of treatment was continued for some time in addition to local intraantral applications and occasional curettment of the reappearing masses in the cavity's interior.

The patient finally returned to Dayton, O., her home, and after lingering along under treatment for about fifteen months, I was informed by her physician that she died. There was no autopsy.

The case presents some interesting points. The development of a malignant growth in a young woman under thirty years of age. The rapidity of the growth, there being no evidence in the operative finding at the first operation to even suggest that we were dealing with anything other than a purulent empyema of the maxillary antrum. At that time we could not quite account for the facial paralysis, and we held that the infiltrate on the soft tissues of the cheek was due to extension of inflammation from the bone to these soft tissues.

Finally, the case demonstrated the failure of the X-Ray applications in a case where the growth was manifestly superficial in the cheek, having grown out from the antral cavity.

Our line of treatment was based upon the idea of removing as much as possible of the accessible portions of the growth and applying the X-Ray to the superficial infiltrate to favorably influence this part of the tumor.

616 Madison Avenue.

A CASE OF CARCINOMA OF THE NASO-PHARYNX AND SPHENOID REGION WHICH RESPONDED FAVORABLY TO THE USE OF RADIUM.*

BY SIDNEY YANKAUER, M. D. NEW YORK.

This patient, who is 26 years old, is suffering from a papillary, cylindrical celled, carcinoma of the nasopharynx and sphenoid region. The case is not only interesting because of the rarity of such growths in this region, especially in so young a subject, but it is also of importance, first from the standpoint of diagnosis, and second from the standpoint of treatment.

The patient states that his nose has been more or less obstructed all his life, but that during the last year the obstruction has been complete, and he has had frequent and obstinate hemorrhages and headaches. Last March, he consulted a colleague, who was kind enough to place his case-notes at my disposal. The doctor diagnosed hypertrophy of the posterior end of the left lower turbinate and some polypoid masses in the nasopharynx. Upon removal of these hypertrophies, their gross appearance seemed peculiar, so that the doctor had them examined microscopically. The report states that the growths lack all elements of malignancy.

The relief of the nasal obstruction brought about by the operation soon disappeared, and the hemorrhages continued. In June, diplopia set in, due to a beginning paralysis of the left external rectus muscle, and in July, this paralysis became complete. When the patient consulted me on October 15th I found that while the anterior half of each nostril was free, the posterior half was obstructed by a growth, which extended into the nasopharynx and filled up this entire space, so that upon rhinoscopic examination with a very large mirror, which he tolerates easily, it was impossible to distinguish any of the structures of the nasopharynx. The entire space from the soft palate to the posterior pharyngeal wall was filled up with the mass, completely hiding the choanae and the Eustachian tubes. A separate flat mass, about one inch in diameter, could be seen extending down the posterior pharyngeal wall. With a snare introduced into the nasopharynx through the left nostril, it was possible to cut off a piece of the growth, and upon examination by

* Read before the Laryngological Section of the New York Academy of Medicine, November 27, 1907.

Dr. F. S. Mandlebaum, Pathologist to Mount Sinai Hospital, it proved to be a pâpillary, cylindrical celled, carcinoma.

Six months before I saw the patient, he had a condition which was diagnosed as an ordinary hypertrophy, but in which the macroscopic appearance of the growth was peculiar. As we do not ordinarily have "posterior ends" examined by a pathologist, especially in a patient at the age of 26 years, when such growths are common, it would be of special interest to all of us to hear from the doctor who removed these growths, just exactly what were the peculiar characteristics which led him to suspect their true nature at a time when the microscope failed entirely to show the slightest evidence of malignancy.

Treatment. The patient was admitted to the surgical service of Mount Sinai Hospital, with the object of removing the growth after resection of the upper jaw. It was now found that there was a slight area of anesthesia of the skin near the left nostril, and this, together with the ocular symptoms, led to the conviction that the growth had already penetrated the walls of the sphenoid cavity, and that the case was therefore inoperable. I then decided to try the effect of exposure to the action of radium.

From Dr. Morris Manges I secured a specimen of Curie radium having a radio-activity of 300,000. As the radium used by Dr. Robert Abbe, who has had such excellent results with this agent, has a radio-activity of 1,800,000, i. e., six times the strength of my specimen, I decided to expose my patient six times as long as Dr. Abbe advises; but as my specimen was known to have produced a radium burn in 20 minutes, some caution was necessary. The exposures were as follows:

November	4,	10 minutes.
November	7,	1 hour.
November	11,	1 1-2hours.
November	14,	1 1-2hours.
November	17,	2 hours.
November	20,	2 hours.

To-day (November 20th), after exposure for six hours ten minutes, during sixteen days, the tumor was so much reduced in size that both Eustachian tubes could be clearly outlined and the septum and lower portions of the choanae distinguished; the patient is able to breathe through his left nostril, and to spray fluids through it. The ocular palsy has not yet been affected. Unless this paralysis

diminishes, it will be necessary to remove a portion of the tumor intranasally, open the sphenoid sinus and place the radium tube into the sinus itself.

I believe that the unfavorable results from the use radium reported at our last meeting were partly due to the fact that the radium could not be used boldly enough. Dr. Abbe uses larger quantities of radium, and exposes the patient for a relatively long time, as long as the individual case will stand without harm.

It will give me great pleasure to demonstrate the case again.

616 Madison Ave.

The Falsetto or Eunuchoid Voice. E. E. CLARKE. *Med. Fortnightly*, Feb. 25, 1908.

The author urges the family physician to offer his advice and successfully treat a condition which is not infrequent, though a true affliction, which seriously affects a young man's career.

The enuchoid voice does not mean abnormal sexuality, for in all these cases the genital organs are found perfectly developed. The evidence shows the condition to be due to a "spasmodic adjustment of the muscles controlling the voice."

Treatment is very simple, usually of short duration, and almost always effective. It consists in "a rigid course of vocal gymnastics and monotone exercises, with development of a proper manner of breathing. From a psychic standpoint the patient should be told that his vocal apparatus is normal, and the condition certainly curable. "Begin by singing a high note and have the patient repeat it, then sing on down the scale until he has reached his lowest register, and then keep his voice at this pitch and repeat the low notes in a loud, forced expiration for ten or fifteen minutes. The low register for reading can be secured by singing his way down; then continuing in the low tone." EATON.

AN UNRECOGNIZED FOREIGN BODY IN THE LARYNX.

BY EMILIO MARTINEZ, M. D., HAVANA.

Errors in diagnosis are many times the source of instruction and perhaps more so than the study of successful cases. Without any desire to criticise the work of the able laryngologists who handled this case before I did and without any attempt to excuse my own error, I think that this clinical history is not devoid of interest.

Near the end of February last, a young man named Adolph L., a native of Cuba, twenty-five years of age, mechanic, consulted me, making the following statement:

On the night of July 18th, 1905, while living in Brooklyn, N. Y., he had the misfortune to swallow his tooth plate. Dr. B., who attended him at first, tried to extract it but found it impossible and took him to a hospital nearby, where another trial was made under chloroform, also without result. Next day a radiograph was taken and he was sent to another hospital in Brooklyn, and esophagotomy performed the afternoon of the twentieth, and the plate safely extracted. He remained in the hospital for a month. Near the end of September he was able to work at his trade as a mechanic, and went to his shop; but he noticed that his respiration was short and he suffered several attacks of asphyxia. He applied agan to Dr. B., who performed tracheotomy on the ninth of October. Following this operaton his larynx was treated, several incisions were made and intubation was attempted twice, but he could not retain the tube. Nineteen days after tracheotomy the canula was removed, but had to be replaced; four days later he was discharged from the hospital. Dr. B. treated him at his office up to the middle of December, without any benefit. A friend took him to one of the large New York Dispensaries, which he attended regularly and was assisted by prominent specialists. He states that he was considered "an interesting case," that many doctors examined him and he served as a subject for various lectures before a large class. He was treated all this time with high doses of iodide of potassium. The professors of this dispensary refused to withdraw the canula and sent him back to his doctor. Dr. B. advised him to wait seven or eight months to have his canula removed, but as he had to live by his work and he could not do it as a mechanic in this condition, he resolved to return to Cuba and sailed on the eighth of February.

When I saw this young man on his arrival on the 12th of February of 1906, he had a complete paralysis of the left vocal cord, evidently from injury to the left inferior laryngeal nerve during the esophagotomy, and marked laryngeal stenosis, not only from the paralysis of the cord, but also from the swelling of the right ventricular band, which occluded the cord on that side. There was apparently no growth on the surface, because the mucous membrane was normal, but the movements were impaired. The patient was hoarse, although he could make himself understood with the tracheal tube closed. A slight cough, every now and then, brought up some secretion but otherwise he was not troubled by his larynx, there being no disphagia, or pain whatever. His general health was excellent.

I did not make a diagnosis, but was inclined to accept the possibility of syphilis of the larynx, as the New York specialists had done, although any antecedent in this respect was denied. He went to his home at Matanzas and two weeks later wrote to me that Dr. O. of the Matanzas Civil Hospital was disposed to withdraw the canula if I advised it. I made no objection, provided he remain at the hospital for some time to avoid an accident. The canula was taken out, and he breathed tolerably well, although he could do no hard work. He remained with his family at Matanzas up to October of the same year, returning at that time to Havana with increased difficulty in respiration, which subsided after treatment with steam inhalations. In December, he once more returned with an attack of asphyxia and I sent him to the Mercedes Hospital of Havana, and my assistant, Dr. Hernando, performed tracheotomy again. He was discharged and returned home, but in March of this year he came back resolved to have something done because he could do no hard work with his canula in place.

I had discarded syphilis as a diagnosis by this time because iodide of potassium had no effect on the lesion; it was not a cicatricial post syphilitic stenosis but an active subacute process. The possibility of neoplasia was suggested by a prominent laryngologist of Havana, who examined the case with me, but the age of the patient and the long time the trouble had remained stationary, obliged me to abandon this diagnosis also; I then suspected there might be a perichondritis of the interior aspect of the thyroid plate. but really this had no better foundation than the preceding ones. I explained the situation to my patient and proposed an exploratory thyrotomy, requesting his permission to proceed then according to the condi-

tions that I might find in the larynx. He willingly accepted and would submit to any risk, as life was a burden to him with this disease.

With a free hand to do as I might think proper, I opened his larynx on the 20th of March (1907), in the ordinary manner for thyrotomy, and after cutting through the cartilage I found the mucous membrane separated, forming a cavity which I supposed was the area of necrosed cartilage. Passing in a curette I commenced to scrape on a rough surface. Very much pleased to have found a diagnosis for my patient, when suddenly the rough surface gave way and I brought it out on my curette. It was a flat bone with a rounded border and rough ends, evidently a fragment of a small rib, the patient supposes, a piece of mutton chop, which he was very fond of eating. The cavity was full of granulation tissue, but otherwise was smooth. After placing a catgut suture to readjust the thyroid, I closed the wound.

The patient made an excellent recovery, and two weeks later I removed the tracheal canula, there being no longer any stenosis and the man breathed freely through his larynx; a small flap of mucous membrane which protruded from the ventricle, I excised with a laryngeal guillotine. He has returned to his shop in Brooklyn, and on the ninth of November last he reported that he was in good condition.

Reviewing the case, I presume that the patient swallowed the bone some time in September, 1905. On account of the recurrent paralysis, he could not dislodge it. He told me that this often happened to him, at that time with grains of rice and other small food particles. The bone was forced into the right ventricle and formed a cavity for itself eroding the mucous membrane and remained there, occluding the lumen for twenty months.

Two important conclusions may be derived from this case:

(a) The remarkable tolerance of the larynx towards a foreign body for so long a period as twenty months, without impairing the patient's health, without great pain and with the only inconvenience of obstructing the glottis by its bulk.

(b) The danger to which any person, with recurrent paralysis, is exposed by his inability to expel a foreign body falling in the cavity of the larynx.

Neptuno 50.

LARYNGEAL NEOPLASMS IN AMERICA.*

BY J. LESLIE DAVIS, M. D., PHILADELPHIA.

While the subject of my paper has been announced "Laryngeal Neoplasms in America," it is only so far as they are concerned in the etiology, aggravating complications and confusion in diagnosis that I have touched upon any neoplasms other than carcinoma. "A Brief Inventory of American Opinions on Carcinoma of the Larynx" would be more appropriate.

The magnitude of the subject, the limitation of time for its presentation and the desire for free discussion demand this curtailment of the scope we shall cover.

The history of carcinoma, whether of laryngeal location or elsewhere, is an interesting story in itself. Clouded always in obscurity, regarded from the early centuries to the present time almost universally as a scourge beyond the power of prevention or the chance of cure, it has builded about itself, through distorted imaginations and the insanity of superstition, a barrier through which the bombardment of scientific research has been slow to penetrate.

But passing this and many other points with mere mention, recognizing the thoroughness with which it has already been covered by numerous writers, I shall without apology choose the more practical features that have been equally as well covered, believing that the greatest need of the hour is the iteration and reiteration of principles already propounded, even though nothing new may have been discovered.

I have, furthermore, chosen to summarize deductions from work done within a certain geographical limit, not with any intention of comparison, not with the idea that what concerns the welfare of one country in the working out of its sufferers' "salvation" is in anywise foreign to the interests of any other land where man is found, nor with the delusion that any line of investigation is being or could be carried out here independent of or uninfluenced by deductions, either true or false, which have been brought out in the work of master minds across the seas.

But in this day when index files are so well distributed, and the literature itself so easily accessible, so thoroughly has the work in foreign fields been collected and brought within the range of our reading that any further attempt at compilation would be only to

*Read before the Twelfth Annual Meeting of the American Academy of of Opthalmology and Oto-Laryngology, Louisville, Ky., Sep. 26-28, 1907.

repeat what has already been ably done by others during the past few years. In fact, there are those who become even more familiar with, and more interested perhaps in, what our distant neighbors are doing, less familiar with the work that is being done and more which needs to be done around us, and entirely oblivious to the fact that in the working out of the mighty task each of us may have some part to perform.

Acknowledging anew, then, our debt of gratitude to the cohorts of the conquering hosts wherever they may be, let us proceed to a brief review of our own "Home Guards" in whose rank and file march veterans of the early struggles and younger volunteers alike, who, in spite of discouragement, are waging slow, perhaps, but effective warfare against this dread enemy of all nations.

It is impossible to consider cancer of the larynx and the effort toward its control independently of the study which has been made of cancer involving other structures of the body, since the laws governing its nature and development are the same wherever found, and, while the larynx is one of the less frequent sites, we can point with pride to the work of a few laryngologists in the front ranks of advanced research. To answer, then, "What have been the perils to progress, and what are the factors that facilitate the study of laryngeal carcinoma?" would be, in a large measure, but to answer the same questions applied to carcinoma without restriction as to site.

Roswell Park, in a recent report of the work of the New York State Cancer Laboratory, speaks thus interestingly of the difficulties at the beginning of their undertaking eight years ago, which in reality differs little from the situation twenty years ago: "The motives which prompted its foundation were the inadequacy of the methods applied in the study of the disease, and the entirely partisan views held by practically every investigator of repute. The histologist regarded cancer as a matter of peculiarity of cell structure; the embryologist held it due to peculiarity of cell activity when actuated by hereditary influences or embryonic perversion; the first looking to the cell itself, the latter to its environment and proclivities. The pathologist could advance numerous suggestions, all the outcome of a study of deadroom specimens, through brass tubes, all ingenious, some extraordinarily and incomprehensively so; all displaying familiarity with the minutiæ, and all evincing especially a lack of familiarity with the disease in the living body—a lack of which has characterized most of the published work on

the etiology of cancer. Tradition or adhesion to long-established methods had governed all modes of investigation, yet no one had the originality to depart from them. A general spirit of pessimism prevailed in all quarters, the more so as a study of statistics made it appear that cancer mortality was on the increase, at least in those parts of the world which most interest us. This spirit of hopelessness had not exhausted concerted effort, but had rather paralyzed endeavor. It was difficult to secure either men who would devote themselves to such blind work, or money to support them in such efforts."

He further states that finally they succeeded, with the result that there was established in Buffalo the first laboratory ever created for the concerted or deliberate study of the most mysterious disease known to us—one which annually kills seven thousand inhabitants in the State of New York alone. He closes with this personal sentiment: "I can not help feeling that we are much nearer the secret so long sought than we were eight years ago. In fact, I feel that the past eight years have taught us more than the previous eight decades."

The work being carried on by this laboratory in Buffalo is to be strongly commended by every one interested in the welfare of humanity, both professional and layman alike.

In reviewing the literature of American authors during the past twenty years on carcinoma of the larynx—which covers the literature of the world as well—one can not fail to be impressed by the truth of the observation made by Delavan regarding surgical statistics, which could be applied equally as well to data other than surgical, namely: "There can be no statistics possessed of definite value or of conclusive weight until a sufficient number of operators of accredited standing in the surgical world have been willing to faithfully and fully report in all of its detail every case which they have had. All thus far published are not only too promiscuous—representing an aggregation of isolated cases with a tendency to the suppression of unfavorable results—but they are further untrustworthy by reason of confusion of cases, with resulting repetition which tends to invalidate percentages."

Thus in an endeavor to obtain a just estimate of the present attitude of the American profession regarding carcinoma of the larynx, it was my purpose to supplement published records by direct expressions from men engaged in laryngeal work throughout the United States and Canada, desiring particularly personal ob-

servations whether in keeping with or differing from the generally adopted conclusions. Unfortunately this course was adopted too late to obtain the good which otherwise might have resulted, since the letters being sent out about August 1 reached their destinations after a considerable number of the men had gone on their vacations, and who returned too late in the summer to compile in a complete form the information requested.

However, from a total of about one hundred and fifty letters mailed I had the gratification of receiving over one hundred replies, some of which were from men who have become well known through extensive work and former publications on the subject; others who had reported but a few cases, and still others who, having come in contact with but a still smaller number, had not reported them nor had they preserved records.

Thus, while some of the answers given were from general observations, rather than from actual calculations, I feel that they are not without value, particularly points not involving percentages.

For the fuller records given I beg to acknowledge my indebtedness to Drs. J. Solis-Cohen and Joseph S. Gibb of Philadelphia, Chevalier Jackson of Pittsburg, Charles K. Knight, Wendell C. Phillips and Jonathan Wright of New York, Walter E. Murphy of Cincinnati, J. A. Stucky of Lexington, W. L. Ballenger, Joseph C. Beck, Otto Freer and Otto J. Stein of Chicago, Henry L. Swain of New Haven, W. Barclay Stephens of San Francisco, James F. McCaw of Watertown, John F. Barnhill of Indianapolis, and George L. Richards of Fall River.

Since some of the reports failed to mention the number of cases treated, I am unable to give an exact aggregate of the total from which my deductions are drawn—though approximately about two hundred—and it is from these alone that the following estimates are made.

About 90 per cent. of cases were males.

In less than 10 per cent., including distant relatives, could hereditary history be obtained.

The wide range in the observations of different men renders the percentage of heavy smokers and alcoholics difficult to obtain. Cohen states: "I attribute no etiologic significance to either excess," while Jackson, Knight, Murphy and Swain report a majority of their cases addicted to both, particularly smoking.

All agree that the most common of early symptoms observed either by them or by the patients was hoarseness.

Pain was not found to be a frequent symptom before the later stages.

Jackson, Freer and Stephens report cases in which pain was absent throughout the course of the disease.

In the early stages, the vocal cords were reported as the most frequent site of intrinsic involvement; the epiglottis and the arytenoids being the most frequent in extrinsic.

The most frequent causes of death were toxemia, starvation and exhaustion.

None believe that any internal medication, alteratives, etc., will affect the growth of the tumor; nor that any local applications have any permanent beneficial influence. All favor operation if it can be done in the early stage. The most common methods employed are thyrotomy in intrinsic and laryngectomy—partial or complete—in extrinsic. Life is lengthened by operation in a majority of cases, and the patient is made more comfortable while life lasts in a very great majority of cases. The percentage in which life is shortened by operation is very small if done early.

To the question, "From what source is the most hopeful outlook for the future prophylaxis and treatment of this disease?" I received a greater number of "blank returns" than to any other question asked; and yet most of those who did reply show a marked unity of opinion, varying mainly in a slight difference of expression.

Beck: "Through mode of living, prevention of irritation, and early operation when discovered."

Ballenger: "Early diagnosis based on (*a*) constant hoarseness, (*b*) age, 40 or past, (*c*) paralysis of one cord."

Cohen: "Early diagnosis and prompt evulsion."

Freer: "To educate the general practitioner to consider all cases of hoarseness in persons past middle age (especially men) serious. Better statistics, earlier diagnosis and operation."

Gibb: "From bacteriological research, and the discovery of an appropriate antitoxin."

Jackson: "General recognition of the frequent malign nature of chronic hoarseness."

McCaw: "In establishing the etiology and nature of growth."

Phillips, Stein, Richards: "Early diagnosis and operation."

Swain: "The recognition of chronic hoarseness as suspicious."

Jonathan Wright: "From a general study of biological processes of nuclear division."

From these personal communications, then, and from published opinions of the past two decades, we can make the following deductions:

ETIOLOGY.

On this point one might modify an utterance of the psalmist of old and well express the situation thus: "Day unto day uttereth speech, but night unto night *faileth* to show knowledge." Various and manifold have been the theories advanced, and yet so frequently have the assertions of yesterday been retracted or refuted to-day that we hardly dare to prophesy for to-morrow.

Animal experimentation, which was for a long time resorted to without any appreciable results in adding to our knowledge of the nature of cancer, has in recent years received a new impulse with the studying of rat or mouse tumors, which seem to be the nearest approach to human cancer yet discovered.

Thus, in support of the parasitic theory, Gaylord cites the instance of an infected cage purchased from a dealer and brought to the New York Cancer Laboratory, out of which sixty or more tumor mice had been taken in the course of three years by the dealer, and in which five cases of cancer developed after the cage was brought to the State Laboratory. He furthermore states that in the State Laboratory, since the beginning of 1905, a typical small spirochaete has been found in all the transplanted tumors thus far examined.

Clowes, of Buffalo, says: "The discovery of the ease with which mouse tumors may be transplanted has led to the development of experimental research in cancer on such a scale as could never have been contemplated five or six years ago."

Bainbridge, in speaking of cancer in general, believes, from the mass of conflicting evidence, the following may be safely adduced, and until the cancer problem shall have been solved will lead no one into danger, namely: that the hereditary and congenital acquirement of cancer are subjects which require much more study before any definite conclusions can be formulated, and in the light of our present knowledge hold no special element of alarm. That the contagiousness or infectiousness of cancer is far from being proved, and that its communication from man to man is so rare, if it really occurs at all, that it can be practically disregarded. And, lastly, that cancer is local in its beginning.

From the standpoint of predisposing causes it is an interesting fact that cancer shows an increase in direct proportion to the advancing scale of civilization; that cancer is least common in the

country districts and most common in the larger cities. In other words, the closer to Nature the individual's habits and the less artificial his manner of living, the rarer are his chances for the "contraction" of malignant disease in any form.

It has been well established and generally accepted that the most frequent immediate factor in the production of cancer is some form of irritant, from which stimulation there is brought about a riotous proliferation of cells while free from their natural restraint.

In the case of laryngeal carcinoma, however, it is not only difficult, but oftentimes impossible to attribute its production to any definite exciting agent.

Thus there is no recognized common cause.

That carcinoma of the larynx occurs most frequently past middle life is in keeping with the characteristics of general cancerous conditions, but that a large majority of cases occur in males is one point of difference, and should be borne in mind in case of suspicion or of doubtful diagnosis.

Some have advanced the opinion that carcinoma of the larynx is brought about through improper or forcible use of the voice, though Jackson observes that in Pittsburg, where chronic laryngitis is exceedingly common, especially among those who use their voices out of doors in all kinds of weather, malignant disease of the larynx is not more frequent than in other large cities with better climate and less frequent occurrence of chronic laryngitis.

Cases are on record which seem to point to tobacco or to alcohol as an unmistakable cause, yet the sum total of evidence does not justify a belief that it plays any important part.

A case now under the writer's observation—age 50 years, who developed an intrinsic carcinoma of the larynx about a year ago—states that for a period of twenty-five years he smoked on an average over twenty cigars a day, and that in recent years he had also been addicted to an excessive use of liquor.

It was this case in which the cause seemed so direct that influenced me to make a special investigation of the part played by tobacco and alcohol, and I confess that it was not without a degree of disappointment that I had to withhold judgment on the ground of insufficient evidence.

Cases are reported in which carcinoma has occurred in connection with or following syphilitic involvement of the larynx, and likewise malignancy has followed the occurrence of benign tumors—a condi-

tion, no doubt, which was in either case the result of prolonged constant irritation.

Wright says: "We must allow the possibility of a benign tumor becoming malignant, though the strongest microscopical proof must be required to admit of its probability in any case." To this observation Jackson adds that to demonstrate the benign nature of any growth it is necessary to excise a portion of it all the way down to and including healthy tissue to make sure that there is not a papillomatous or other benign proliferation on the surface of a malignant growth.

The possibility that in the common symptom of chronic hoarseness may be found a clue to a frequent cause is not to be lightly overlooked.

Jacobson observes: "Etiologically, cancer is of intangible dynamic nature, which explains the baffling of investigators; they are looking for something tangible, though the tangible things they find are all secondary.

DIAGNOSIS.

If in the light of present knowledge cancer is to be regarded as local in its origin, and that in this early period of confinement it may be removed by radical operation so perfectly that the chances are overwhelmingly in favor of its non-recurrence, then does the burden of responsibility rest heaviest upon those in position to make the earliest diagnoses.

To me the most promising outlook for the future control of laryngeal cancer comes not from laboratory prophesies of approaching revelations in the nature and cause of the condition, small though our knowledge at present may be; not in the hope of new methods of detection or of signs pathognomonic, though confusion of symptoms may cause deadly delay; not from any fancied faith in the final discovery of a specific, though we would hail such a cure with though our present can not be called faultless; *but rather in a crusade already begun that shall sweep our whole country in teaching the few principles already proven for making the earliest diagnoses.*

To make this most effective is needed the cooperation of every teaching institution, and the author of every text-book that deals not only with the special branch of laryngology, but general diagnosis as well.

Consult the list of our most popular text-books on the practice of medicine, or on general diagnosis, and note how few contain any

reference at all to malignant disease of the larynx, and yet it is on these that the majority of general practitioners have depended. From one of the most authoritative of modern books on medical diagnosis I quote: "Malignant disease in various forms may affect the structures of the larynx. A positive diagnosis can be made only with the aid of the microscope. Yet the detection at the seat of the larynx of a growing tumor accompanied by severe cough, by sanious sputum, by signs of destruction of tissue, by perichondritis and exfoliation of the laryngeal cartilages, by hemorrhages and by emaciation, warrants the diagnosis of cancer, whether or not much pain be present. This may be confirmed by the subsequent rapid development of the malignant disease, association with a musty odor of the breath, distress in swallowing, bloody expectoration, and cachexia."

Such is the clinical picture found in many a case when referred to the "specialist" for treatment.

At least one good lesson is derived from a statement made in not less than ten of the answers received in reply to the aforementioned circular letter sent out to laryngologists: "I am not in position to make any report on carcinoma of the larynx; while a number of cases have come under my observation, the disease was too far advanced when first seen for anything to be done."

Was it the general practitioners' fault that these cases were so far advanced before being diagnosed, if in his college course or text-book reading a method of early detection had not been taught?

Can the patients themselves be blamed for believing that cancer is a disease for which nothing can be done?

Hence we hail with delight the encouragement which has been given to clinical teaching of the "special branches" (otolaryngology, etc.) in some of our leading medical colleges in recent years.

The student of to-day is the physician and the teacher of to-morrow, in the thoroughness of whose education rests the nation's hope for the future dissemination of knowledge.

In this connection we might well call attention to one great peril to progress in the tendency of patients to diagnose their own conditions from "knowledge" gathered from the lay press—which oft-times is but a wild and erratic creation from the fertile fancy of a dreaming reporter—and then treat themselves with concoctions and cures, which the same press advertises, till all chances for relief through rational means are lost by delay.

No new theory relative to disease, says Bainbridge, can be propounded or research work reported without the probability of exaggerated versions thereof being flaunted in the public press of the civilized world to make upon the minds of the credulous masses impressions for good or ill as the case may be. Reputable physicians, actuated by one kind of motive or another, not infrequently give expression through the medium of the medical press to conclusions drawn from premises that have not been and often can not be verified, and thus confusion worse confounded arises in the public mind concerning matters medical. The public has a right to know the results of all scientific research, particularly as it pertains to health and disease, and more particularly when the public's money defrays the expense thereof. But they should not be overwhelmed with theories formulated in the laboratory, and frightened by specters that oftentimes exist only in the microscope, or rather in the mind of the microscopist.

Chronic hoarseness in the aged is the most trustworthy early warning of possible malignancy that we have..

The characteristic lancinating pain of carcinoma in other parts of the body are not present in all cases of laryngeal carcinoma, and then not before the later stage.

In Stein's admirable paper before the Academy last year we find this statement: "Just because a patient manifests no characteristic cachexia or has no dyspnea or fetid breath, blood-stained expectoration or pain referred to the ears, does not justify one in dismissing the consideration of the possibility of malignancy. To wait for these classic symptoms (these text-book symptoms) is to throw away in many cases the last hope of saving one's patient."

The following observation by the same author is timely: "One of the strongest clinical evidences of malignant involvement I have found to be infiltration. The infiltration is not pathognomonic nor has it any characteristic appearance. Many of these infiltrations have no sharp line of demarcation, but blend imperceptibly with the surrounding structures. At times the infiltration originates deeply or in recesses like a ventrical or is hidden from observation by the cords so that its early recognition becomes impossible; but on account of the pressure it may exert on a branch of the motor nerve or by direct encroachment on the intrinsic muscles there is seen a lazy action of the vocal cords. This sign of lagging during an attempt at phonation when associated with chronic

hoarseness should always arouse suspicion and awaken watchfulness."

Syphilitic and tubercular lesions of the larynx may give rise to confusion in diagnosis, particularly the former, in which case the therapeutic test is to be employed. Owing to history, age, location and character of onset and mode of development, tubercular involvement is usually far more easily differentiated.

Simple papillomata are the most frequent benign neoplasms, and likewise the most frequent source of anxiety to the diagnostician. Probatory intralaryngeal removal of pieces of a growth for examination should not be done without consent to radical operation if found to be malignant, and the piece removed must represent all parts of the tumor.

TREATMENT.

This division may be considered under two heads—surgical and non-surgical, either method having advocates equally emphatic in their claims of cure, with cases of non-recurrence to support them in their views, and there are those who condemn all methods alike as futile. "All honor to him who honestly doubts, if through doubt arises investigation, and through investigation conviction," but let us strive not to become prejudiced against any method which has not been fairly tested, nor overzealous for another till it bears the test of time.

The sum total of evidence is to-day undoubtedly in favor of radical operation, thyrotomy being employed in intrinsic carcinoma, and laryngectomy, partial or complete, in extrinsic; and in either case the nearer the operation follows the incipient stage of involvement the greater are the chances of cure.

The question, "Who should operate, the general surgeon or the laryngologist?" has ofttimes been discussed. The argument has been advanced that the one most accustomed to doing major surgical work will employ most careful technic as well as skill in its application. On the other hand, should not the laryngologist who devotes his whole time to the study of a localized field, to its functions as well as its structure, acquire the most perfect knowledge of the part?

It has been suggested that in such operations the laryngologist and general surgeon each has a part to perform; but whoever the operator may be, in the words of Watson, "he must see to it that his enthusiasm is tempered by experience, his courage justified by skill."

The technic of operations does not come within the scope of this paper. Suffice to say that I have been unable to find in the latest American literature anything that could add to the excellency of such methods as those so effectually employed or recommended by Cohen, Crile, Delavan, Halstead, Hartley, Jackson, Keen, Knight, Mackenzie and others.

Of the non-surgical means which have been employed in treatment we shall not attempt to tabulate those already discarded—even though they at some time may have been widely and enthusiastically advocated, but rather give space to a brief consideration of methods which are now being tested.

Treatment by pancreatic enzymes, while discredited by the majority of the profession, must still be regarded as an unsettled question. We shall await with interest the further tests being carried out by one so competent as Bainbridge, who in a preliminary statement remarks:

"Needless it is to say that a few months' trial in a limited number of selected cases can not suffice to forever settle the merits of any method of treatment of cancer."

In view of his name having been used against his will in connection with a reported case of remarkable results from use of trypsin, and widely published by the lay press as well as in medical journals. Dr. Bainbridge says: "In justice to the earnest, truth-seeking element of the profession, both here and abroad, in justice to cancer sufferers the world over, in justice to Dr. Beard and, lastly, to myself, I find it necessary to write as I do now in advance of further definite information. To remain silent longer would tacitly give assent on my part to much that is misleading. The facts as they pertain to the case published do not warrant the slightest enthusiasm as regards cure. While this case is full of disappointment, it presents certain features which give sufficient ground for careful trial of the pancreatic treatment."

T. H. Evans, writing of the presence of sugar in cases of cancer, states that the use of either trypsin or amylopsin will probably be rendered more effective in connection with a diabetic diet. "It is evident that the conflagration of sugar in the body may be destructive to surrounding tissue. We do not wish to supply fuel to the match which we apply in the form of pancreatic ferments." He further observes that the use of diabetic diet should be thought of as a postoperative treatment in cancer, which may delay metastasis and return, and that it is possible that cases of inoperable cancer

may be rendered operable by the employment of injections of trypsin or of amylopsin, or of both with an absolute diabetic diet.

The x-ray treatment must be regarded of value when applied in connection with or following operative procedures.

Delavan speaks of the x-ray as the best means at our command for the relief of some of the worst symptoms of advanced laryngeal carcinoma, such as pain, excessive secretion and fetor.

Of the ultra-violet and the high-frequency rays, and likewise of radium from which interesting results were expected, I have not been able to find any reports of conclusive evidence regarding their value.

The field of therapeutics has been well worked, but without avail, in search for an agent that will exert some influence over malignant growths. Still, there are well-marked indications for therapy which should be met as they arise. If toxemia is the most frequent cause of death, it should be guarded against by promoting free elimination throughout the course of the disease. Exhaustion must be met by stimulation, and starvation obviated through some means of nutrition adapted to each case.

1700 Walnut Street.

A Fatal Case of Anglo-Neurotic Œdema. HENRY BAZETT. *Lancet*, Oct. 12, 1907.

The author was called to see a man, aged 23, seized with choking, but found on arrival he was dead. The eyelids of both sides were so swollen that it was difficult to get any view of the pupils; the cheeks and lips were swollen; and the neck appeared to be nearly twice its natural size. The remainder of the body was unaltered and ill-nourished.

Post-mortem examination revealed marked oedema of the ary-epiglottic folds. The urine was normal.

Previous history of the case showed that, since the age of 6, the patient had been subject to attacks of abdominal colic, with sudden swellings of various parts of the body, usually in the hands, thighs or scrotum, and subsiding in twenty-four hours.

THOMSON.

A METHOD OF PREVENTING HEMORRHAGE DURING ADENECTOMY.*

BY SAMUEL IGLAUER, B. S., M. D., CINCINNATI.

The operation for the removal of adenoid vegetations is usually attended by the loss of a considerable volume of blood. If, as is usually the case, tonsillotomy be performed at the same time, the total hemorrhage is of necessity increased.

Considering the fact that the adenoid patient is often a delicate, anemic child, it would seem desirable to limit the operative hemorrhage, if possible. There can be no doubt that a sudden loss of blood increases the danger of the anaesthetic, as well as the shock of an operation. Hemorrhage also increases the risk of infection, as proven by studies in experimental anemia in animals. (Albutt's System of Medicine.)

One of the chief difficulties encountered by the operator during adenectomy and tonsillotomy, is the hemorrhage, obscuring the field of operation. In other branches of surgery, the operators pride themselves upon minimizing the loss of blood, and there is no particular reason why the laryngologist should limit his endeavors in this direction. From a cosmetic point of view, adenectomy is far removed from the domain of "beautiful" operations, and in our general hospitals one now seldom sees a considerable flow of blood, except at the hands of the obstetrician, and of the laryngologist. Hitherto considerable attention has been paid to the position of the patient during adenectomy in order to avoid the aspiration of blood, but practically nothing has been done to prevent the hemorrhage itself.

Technique: In order to control the hemorrhage of adenectomy, I have devised the following method: It consists essentially in introducing the draw-strings of a post-nasal tampon before beginning the operation, and in drawing the tampon into place immediately following the adenectomy.

The instruments necessary for this procedure are, first: A modified Bellocque canula, made of a slender, hard rubber Eustachien catheter. I have found the ordinary metal canula too thick and rigid for this purpose. Second: A rubber sponge (such as may be

* Read before the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Louisville, Ky., September 26, 27 and 28, 1907.

purchased at any drug stone), of proper size, to serve as a post-nasal tampon. These sponges, owing to their elasticity, make excellent tampons and can readily be sterilized by boiling. A stout piece of tape is passed through the sponge, tied about it and left with the ends about a foot long. The patient is anaesthetized until the pharyngeal reflex is partially abolished.

By means of the canula introduced through the nose, one end of the tape is withdrawn through the nasopharynx and out of the nostril. The other end of the tape with the tampon attached is allowed to hang out of the mouth. An assistant now makes traction upon the two ends of the tape, which thus serves as an admirable palate retractor, giving the operator more room and permitting the use of the curette or of a forceps with but little danger of catching the velum.

The adenectomy is now performed in the usual manner. Immediately thereafter the tampon is forced into place by the assistant drawing on the nasal end of the tape, while the surgeon with his index finger crowds the plug into the naso-pharynx. Owing to the size and elasticity of the rubber tampon, the hemorrhage is immediately controlled.

The operator can now proceed with the removal of the tonsils, if these are enlarged. In case the tonsils are very large, they should be removed before beginning the adenoid operation.

The tampon is allowed to remain in position for a few minutes after the adenectomy, when it may be removed, as there is but little tendency to hemorrhage after the tampon pressure has been maintained for a short time. The tampon is easily withdrawn by pulling on the one end of the tape which has been left long for this purpose.

Report of Cases: I have notes on eighteen cases in which I have employed this method. The patients ranged in age from two to seventeen years. Gas and ether, or ethyl chlorid and ether were employed in all the cases, excepting one case of ethyl chlorid, and one of straight ether anesthesia. In practically all the cases, the tonsils were removed at the same time as the adenoids and this may account for the blood vomited by some of the patients. This vomiting, however, is recorded in the first five cases when the technique was being perfected, and is noted but once in the succeeding operations. The primary hemorrhage was easily controlled in all the cases in which the tampon was properly inserted. There were no secondary hemorrhages.

The Bellocque canula should be introduced with great care in order not to wound the nose or the adenoids. With the ethyl chlorid cases, the anesthesia was too transient for this method.

One or two of the patients, insufficiently anesthetized, seized hold of the draw strings. There were no ear complications in these cases and no sequelae traceable to the tamponade. I am indebted to Dr. Dickson and Dr. Enz for assisting in the tabulation of these cases.

Conclusions: It must be admitted that certain disadvantages attend the method of operating described above. In the first place it requires a somewhat deeper anesthesia than ordinarily employed for the adenoid operation. Secondly, owing to the time occupied in introducing the tampon, it cannot be employed with evanescent anesthetics, such as ethyl chlorid or nitrous oxid. Finally, it slightly complicates an otherwise rather simple operation and requires the aid of a good assistant.

The advantages which result from the employment of the tampon method may be enumerated as follows:

1. The draw-strings acting as a palate retractor protect the velum and permit a more thorough use of the adenoid forceps than is ordinarily the case.

2. The hemorrhage is checked immediately it is begun. The loss of blood is thus reduced to a minimum, decreasing the immediate risk of syncope and the subsequent chances of infection.

3. The field of operation is left anemic for tonsillotomy.

4. Ether anesthesia, (or gas and ether anesthesia), much safer than chloroform, may be employed, since the cerebral engorgement resulting from ether inhalation is counteracted by the tampon.

5. Post operative nausea and vomiting due to swallowed blood are partially obviated.

6. The danger of aspirating blood into the trachea is diminished.

These considerations it would seem make this method worthy of further trial and extension, so that some day combined adenectomy and tonsillotomy may become an almost bloodless operation.

22 West Seventh Street.

HEMORRHAGE FOLLOWING TONSILLOTOMY WITH COLD WIRE SNARE.

BY C. R. DUFOUR, PHAR. D., M. D., WASHINGTON, D. C.

For several years I have been removing faucial tonsils with the cold wire snare, finding it to be the most efficacious method of removing them. Years ago I discarded the tonsillotome, as being cumbersome and not an efficient instrument. Enlarged or submerged tonsils can be entirely enucleated and with less hemorrhage by means of the snare than with the tonsillotome or scissors.

In hundreds of operations I have had only one severe hemorrhage from the use of the snare. The case is as follows: Mr. L. white, aged 35 years, came into my office and requested me to remove his tonsils, saying they bothered him very much and caused a continual bad taste in his mouth, and that he had frequent attacks of tonsilitis. I found them very large and standing out prominently from between the pillars. The crypts were filled with cheesy matter, the odor of which was very offensive. They were hard and fibrous in character. I told him I would only remove one at a sitting, to which he consented. After swabbing it with a 6 per cent solution of Alypin, I loosened the pillars, with a tenaculum drew the tonsil into the snare and completely enucleated it. There was not much bleeding. After keeping him in the office for a while, I sent him home, with orders to remain quiet until the next day. That afternoon a physician 'phoned me that there was in his office a man whose tonsil I had removed that morning, that it was bleeding so persistently that he could not arrest it, having run the gamut of styptics. I requested that he be sent to my office, which was done. I tried to arrest the bleeding with the galvano-cautery, pressure, etc., but could not. The vessel was at the bottom of tonsillar space, near base of tongue. I soon found that it was no ordinary hemorrhage and must be stopped at once, as he had lost two or three pints of blood. I sent him to the hospital, and while waiting for me, he lost at least another pint. I arrived at the hospital about fifteen or twenty minutes after he did. I took him to the operating room, placed him on his back on the table, and by aid of an electric head mirror to illuminate the throat, I passed a suture through the lower part of the posterior pillar, drawing it forward and over the bleed-

ing vessel, the suture was then passed through the anterior pillar. A continuous suture was thus used, suturing posterior and anterior pillars together. This stopped the hemorrhage at once. He was kept in the hospital all night. He refused to remain longer, so went home the next morning. I judged that he lost between three and four pints of blood. He was pretty well exsanguinated, but soon recuperated. The stitches were removed in a week.

1343 L street.

Nasal Suppuration Due to a Rhinogith Causing Complications Simulating a Gastric Affection. Dr. GAYET. *Presse Med.*, April 24, 1907.

The case was a young man of 19, who, after a pleuro-pneumonia complicated with peritonitis, had discharges and fetid vomitings suggesting gastric disease. After a prolonged examination, the seat of the putrid discharge was found under the inferior turbinate body of the nose. Here in the midst of the discharge and debris was found a canine tooth which was missing from the superior maxilla, the last incisor being almost in contact with the first molar. The patient recalled having had a severe blow on the nose in his early infancy. All the symptoms disappeared on the removal of the foreign body. SCHEPPEGRELL.

Radical Cure of Chronic Suppurative Otitis Associated with Mental Confusion. Dr. GUISEZ. *Bull. de Laryngol*, Oct. 1, 1906.

The author reports the case of a young girl in whom the radical cure of a double otitis of long standing caused the disappearance of mental disturbances of a confusing character.

The relation existing between the mental disturbances and the diseased condition of the ear had been remarked for a long time; most frequently there were phycho-sensorial disturbances (hallucinations of hearing) more or less directly connected with the lesion of the auditory apparatus.

The cases of mental affections so distinctly characterized and consecutive to a suppurative otitis are somewhat rare, and give interest to this case. SCHEPPEGRELL.

A CASE OF SEVERE PRIMARY HEMORRHAGE FOLLOWING THE REMOVAL OF THE FAUCIAL TONSIL.*

BY OTTO J. STEIN, M. D., CHICAGO.

Every case of severe hemorrhage following the removal of the faucial tonsil is of sufficient importance to be placed upon record.

The report of the following case records the severest hemorrhage following this operation in my hands, and at the same time emphasizes the necessity for more careful inquiry into conditions that argue strongly against operating.

A young lady, 20 years old, was referred to me four weeks ago for examination. The right nostril exhibited pus in the middle fossa, which came from the ethmoid cells. Quite a large mass of adenoids occupied mainly the left side of the pharynx vault, and the left tonsil, of medium size, was embedded and the seat of frequent cryptic disturbance.

Attention was first directed to the suppurative ethmoiditis, and by exposure of the cells, after removal of the anterior part of the middle turbinal, followed by irrigation, the purulent process ceased entirely after two weeks. As soon as the nose was entirely free from pus, the adenoids were easily removed under cocaine anesthesia. One week later, the left tonsil was enucleated under cocaine. This dissection was easily and quickly performed so that the entire gland with its investing membrane was secured. As is customary with me in tonsil dissections, I used a small sharp knife, the same spud-shaped knife used in the submucous resection of the nasal septum, a curved pair of scissors and a pair of tenacula spring blade forceps. The dissection was easily carried out between the fibrous capsule of the gland and the tonsilar fossa, but I took notice of an arterial oozing that occurred shortly after the apex of the gland had been liberated, and contrary to what is customary in such dissections, this oozing was prominent throughout the remainder of the operation. The gland was then quickly removed in its entirety and there followed the customary increased amount of bleeding for a few minutes, but this soon subsided to a general oozing. On inspection a clot was seen occupying the entire fossa, but around the

*Read before the Chicago Laryngological and Otologgical Society, October 8, 1907. For discussion see The Laryngoscope, December 1907, page 971.

clot the bright red blood continued to ooze. At first ice water was held in the mouth and then ice itself was used. After half an hour the clot was removed in order to thoroughly inspect the operated surfaces for the source of the bleeding, but even though a good view of the entire fossa could be obtained, there was nothing to be seen excepting the oozing from all surfaces. Various well-known styptics were used and held firmly applied for several minutes, but with no benefit. The use of ice was continued for two hours. In the interim, two hypodermic injections of ergone, (P. D. & Co.) 30 minums each, were given at an interval of 30 minutes, but the bleeding was increasing in place of diminishing.

After two hours had passed and every effort used to control the hemorrhage had failed, I felt it timely to resort to some more radical measure and thereupon applied a Stoerck-Miculicz tonsil hemostat, the pad of which was wet with adrenalin chloride. Very firm pressure was necessary in order to check the bleeding entirely. The patient was then moved to the hospital for better observation during the night. After leaving the hemostat in place for two hours, I very carefully removed it and inspection could discover no further bleeding at any point.

At first I was at a loss to understand the cause of such free and continuous bleeding, but the volunteered statement of the patient during the height of the hemorrhage explained away all doubt in my mind why we had this alarming and annoying complication. She was in the second day of her menstruation.

I invariably avoid operating on tonsils or adenoids under three conditions ;an acute inflammation, during menstruation or advanced pregnancy and in the hemophilic. As I had operated on this patient both in her nose and for the removal of adenoids, I dismissed the hemophilic condition, and as she was free from any acute inflammatory process, I overlooked inquiring into the menstrual condition.

A severe hemorrhage at this time in the life of a young woman is a serious matter, because the reactionary shock on the whole nervous system, and especially upon the procreative organs may have a far-reaching effect upon her future welfare. I believe cases of this kind should urge us to exercise the greatest caution so as to avoid operating on tonsils and adenoids if possible during or just prior to the menstrual period.

100 State Street.

A CASE OF UNCHANGED BOY'S VOICE IN A MAN WHICH WAS MADE NORMAL BY SINGING EXERCISES.

BY W. L. HOLT, M. D., PHILADELPHIA.

The following remarkable "cure" was performed by Miss Groff, a well-known singing teacher of Philadelphia, living at 222 North 13th st. The patient, Clarence R. was recommended to her with an "unchanged," that is undeveloped, boy's voice. He had a good-sized larynx, was well-developed physically in every way, and sexually normal. At the age of twelve he had a fine soprano voice. Then he had scarlet fever, and although he suffered no paralysis of the vocal cords, his voice never developed at puberty, and when he came to Miss Groff, at the age of twenty-six, he spoke like a boy and could sing only in the treble clef. It is interesting to note that he was a very good pianist but extremely shy because of his abnormal voice.

The year before he had consulted two famous throat specialists in Berlin, and they pronounced his case hopeless after treating him with electricity in vain. They could find no organic defect in the vocal mechanism, however.

Miss Groff based her treatment on her theory of voice-production, and the result she thinks tends to confirm her theory. It is in brief that the voice is produced not by the vibration of the vocal cords, but by that of a column of air contained in the cup-shaped cavity of the larynx between the false and the true ventricular bands. She declares that the true vocal bands act as do a man's lips in playing a horn, to regulate the pitch, and that in a man the upper bands have two positions; a lower one which shortens the air column for high notes and an upper one which lengthens it for low ones. The proper adjustment of these "false" bands is as essential in voice production as that of the true.

However that may be, Miss Groff gave him special singing exercises, laying stress on proper breathing and vigorous use of the lungs. After six weeks of such exercises he spoke one day in a normal man's voice, and although before he could sing only soprano and speak only in a childish treble, he then suddenly began to sing bass. Having once "found his voice," he has never lost it, and now, a year later, sings a good low bass and speaks in a normal man's voice.

Needless to say, the world is a thousand-fold brighter to him.

Miss Groff cites this "cure" in confirmation of her theory, explaining the result by supposing that her pupil so increased the force of the air column that it pressed the false bands upward into the proper position for low tones.

Was not development and training of the laryngeal muscles by the singing exercises also probably a large factor in the happy outcome?

Children's Hospital.

Laryngofissure for Papillomata. Prof. G. FERRERI, DE ROME. *Rev. Heb. de Laryngol. d'Otol. et de Rhinol.*, May 25, 1907.

In January, 1903, the patient, a woman of 52 years, commenced to suffer from her throat, the voice becoming more and more feeble. In August, a large number of papillomata were removed by the endolaryngeal route. The voice, however, began to fail again, and soon there was complete aphonia and attacks of suffocation.

In May, 1905, a laryngofissure was made after a preliminary tracheotomy. A large mass of papillomata was removed, the origin of the neoplasms being in the ventricle of Morgagni. The canula was removed on the 10th day, the case resulting in a permanent cure.

According to the author, laryngofissure is preferable to intervention through the natural passages. Especially is it a more practicable operation for children. Should the papilloma prove to be the initial stage of the development of cancer, the opening of the larynx permits the entire extirpation of the neoplasm.

SCHEPPEGRELL.

A NEW NASAL SEPTAL FORCEPS.

BY SAM GOLDSTEIN, A. B. M. D., NEW YORK CITY.

The submucous operation has undoubtedly, in properly selected cases, been given a permanent place among the number of measures (if it has not altogether superseded all others) adopted for relief of the various deformities of the nasal septum. Whatever doubt may have appeared concerning its efficiency over all other previously accepted methods of operative procedure, when first placed before the surgeon for his endorsement, has most assuredly been dispelled in the face of the universal acknowledgment given this pronounced advancement in technique in nasal surgery.

The only divergence of opinion that might arise at the present day could be the operator's own preference of detail in method or choice of anaesthesia, and instruments employed, or amount of tissue to be removed in the individual case. As these methods are more and more clearly demonstrated, so in proportion is our knowledge and skill enhanced in this particular line of nasal surgery.

At the inception of this operation the instruments designed for our use were few, and although undoubtedly of value at that time, were later found to be inadequate for all of the varieties of nasal septal deformities. As was but natural under the circumstances, many and varied are the new and likewise modified instruments regularly appearing, many of them of undoubted and proven efficiency, almost indispensable to some of us in this work, others equally useful, perhaps, to the inventors thereof, but hardly to be recommended for the general operator, especially the beginner, in this field.

For a considerable length of time we have been seeking a good working instrument that could be universally and safely employed for removing any manner of deformed vomer or maxillary ridge that so often complicates septal deflections and dislocations. Varied styles of knives, forceps, gouges and chisels have been recommended by operators for the removal of this deformity, occurring so frequently and undoubtedly requiring the most immediate attention. Up to the time of perfecting the model of this forceps, that is now presented for approval, we had not found an instrument that could be so readily or safely employed for the removal of any

or all of the maxillary ridge deformities so commonly encountered. From the very nature of the septal deformity, occurring at or near the nasal floor, and projecting so far posteriorly at times to present the real septal difficulty, by its interference in nasal respiration, its complete removal was the real problem that confronted and so often puzzled us.

The solution of this problem meant to us the production of a forceps so constructed that after all of the deflected cartilage which could be removed without endangering the stability of the septum was accomplished, the deformed portion of the perpendicular plate of the ethmoid, if so presenting, disposed of, we should have an instrument ready for use that with the least loss of time, now so valuable as we are approaching the final stages of the operation, which could be introduced simply, grasp the deformed vomer at

the maxillary ridge, bite through, and permit of its immediate and safe removal.

Such an instrument, judging from our experience with the same, is now presented in the hope that it will fill an hitherto present void. Although this forceps was purposely designed for attacking the maxillary ridge, we have since found that it can be more generally employed, viz., in removing cartilage not included in the sweep of the Ballenger swivel knife; in removing deflected portions of the perpendicular plate of the ethmoid bone and exostoses on the floor of the nose; with further experience perhaps other uses in nasal surgery may also be found for this instrument.

The forceps is purposely very strongly fashioned and provides for a good clean even bite of such bone and cartilage as may be deemed necessary for removal from the nares.

The bends or curves in the blades of the forceps were so designed to not only preclude any chance of the surgeon's hand interfering with his vision of the nasal field while operating, but to allow, as well, as full a dip of the jaws of the instrument as required to

include the lowest possibly placed septal deformity that might be encountered.

The jaws of this forceps also permit of a sufficiently large bite of the parts regarded as requisite for removal; thus, by avoiding its too frequent introduction, unnecessary injury to the septal mucosa is prevented.

The forceps consists of two pieces joined by a screw lock, about one-third of the distance from the cutting parts; the Collin flap at the distal end affords additional strength to the instrument.

The ring handles are bent downward at an angle of about 45 degrees from the body of the forceps, and open parallel with the cutting jaws, one of which is fenestrated.

The jaws resemble somewhat the shape of an "S," and are bent downward about three-eighths of an inch from the body of the instrument.

For patience in the production of numerous models, and for his valuable assistance, my thanks are due to Mr. I. S. Goldstein, of the Surgical Instrument Department of E. B. Meyrowitz, of this city.

1335 Madison Ave.

The Bier Treatment in Otology. LEUTERT. *Deutsche med. Wchnschr.*, Aug. 1, 1907.

After a review of the literature and of his own experience, the author takes the following standpoints:

(1) The Bier treatment is useless in chronic otorrhoea.

(2) Its use is dangerous in mastoid suppuration on account of the proximity of the sigmoid sinus.

(3) Its value has not been demonstrated in severe forms of acute suppuration as in those following scarlet fever and measles, and its employment in these cases must be undertaken with great circumspection.

(4) The results in recent mild cases are not conclusive.

(5) In early mild cases paracentesis relieves the pain and fever in shorter time. YANKAUER.

A NEW PROCEDURE FOR THE CORRECTION OF THE SADDLE NOSE.

BY F. E. WAXHAM, M. D., DENVER, COLO.

While the injection of paraffine for the correction of this unsightly condition has had many advocates, yet many have abandoned it on account of accidents and unfortunate results. It requires much pressure to raise the sunken tissues to the proper elevation and as the paraffine under this pressure, will seek the areas of least resistance, it will often spread, in spite of all precautions, to the end of the nose, the cheeks, or about the eyes. Under this great pressure the danger of embolism is also great.

Among the many objections to paraffine prothesis the following have been enumerated by Gleason as among the more important. Infection followed by sloughing or abscess. Pressure necrosis from injecting too much paraffine. Deformity from hyperinjection or from spreading into the wrong place. Embolism from the injection of paraffine in a too liquid state and to these may be added pressure necrosis, from too great pressure, in the effort to elevate tissues too deeply sunken or bound down by adhesions.

All of these dangers I believe can be obviated; the danger from embolism, by injecting paraffine in a semi-solid state and by avoiding too great pressure; the danger from infection, by proper sterilization, and perfect asepsis; the danger from pressure necrosis by care in not injecting too great a quantity of paraffine. The danger from spreading of the paraffine into undesirable locations as well as from pressure necrosis can be avoided by a new proceedure. It consists in making an incision through the skin at the root of the nose, separating the tissues with the curved scissors or spud, such as is used in the submucous resection of the septum, carefully raising and stretching the skin and subcutaneous tissues with an elevator. A warm sterilized solution of adrenalin (one to three thousand) is now introduced through the incision and between the separated tissues and retained for a few minutes. This controls the bleeding, contracts the blood vessels, and thus lessens the danger of embolism. Paraffine at a melting point of 110° to 115° is now injected through a blunt pointed slightly curved needle and deposited at the fartherest portion of the separated tissues. As the needle is gradually withdrawn, more of the paraffine is deposited. Only slight pressure is required, simply a sufficient amount to elevate the already separated tissues. To prevent the return of the paraffine through the incision, firm pressure is made at this point, or the incision may be closed previously with fine sutures.

SOCIETY PROCEEDINGS.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, March 11, 1908.

A. H. ANDREWS, M. D., PRESIDENT.

PRESENTATION OF CASES.

Cyst of the Epiglottis. By JOS. C. BECK, M. D.

Dr. Beck presented a child, who, when first seen, was cyanotic, spoke with difficulty and presented all the symptoms of a laryngeal obstruction, a condition which was said to have existed since birth. A tumor was palpable in the region of the epiglottis. A laryngoscopic examination was impossible. A puncture of the tumor yielding nothing. A tracheotomy gave relief from the distressing respiratory symptoms. On incising the tumor, a gelatinous, greyish fluid was evacuated. The cyst led into the fossa pyriformis and was attached to the epiglottis. A cautery point was passed into the cyst cavity and it was cauterized thoroughly. The child improved and made a good recovery. Speech is normal. At the site of the tumor is an infiltrated mass.

Excision of the Jugular Bulb. By JOS. C. BECK, M. D.

This patient had typical sinus thrombosis, with 40,000 leucocytes and symptoms of thrombosis of jugular vein, extending down to the level of the thyroid cartilage. The sinus was excised to midway between the torcular and transverse sinus, to back of the mastoid, and down to the formation of the jugular bulb after the method of Alexander.

DISCUSSION ON DR. BECK'S CASES.

DR. GEORGE E. SHAMBAUGH:—These cases of thrombosis of the bulb of the jugular present one of the most difficult problems in the surgery of the temporal bone. It may be difficult in the first place to determine in which cases one is justified in interfering with a thrombus in the bulb, and in the second place the operation required to expose and clean out the jugular bulb, may in certain cases present almost unsurmountable difficulties on account of the high position of the bulb. I have some preparations where for example

the upward bulging of the dome of the jugular bulb extends through the superior wall of the petrous portion of the temporal bone. In such cases the exposure and complete cleaning out of the bulb necessitates an operation so extensive that in itself it may be much more formidable than the danger from the thrombus.

The mere presence of a thrombus in the jugular bulb is not in itself sufficient reason for the undertaking of an operation that is always difficult, and may be quite formidable. Whether the thrombus in this locality ought to be removed should depend upon whether it is infected or not infected. If it can be determined at the time of the primary operation on the lateral sinus that the thrombus in the bulb is an infected one, that is, if a foul-smelling, broken-down thrombus extends up toward the jugular bulb, I believe we are justified in carrying on the operation so as to expose and clean out the bulb. If on the other hand a firm and to outward appearance non-infected thrombus is found extending into the bulb of the jugular, I believe the conservative altitude is the correct one, for should it turn out that the thrombus is as it appeared to be, not infected, experience has shown that the patient is quite safe with the thrombus left alone, and in this way many of these cases can be spared the dangers of a difficult operation. On the other hand, should it turn out that in spite of its normal appearance, the thrombus in the bulb is an infected one, which is also possible though perhaps not probable, then the subsequent history will show a continuation of the septic temperature curve and under such circumstances one is again justified in undertaking the operation on the bulb. In that way alone unnecessary operations can be avoided.

The anatomical variations in the position of the jugular bulb are the most striking. In some cases the bulb is so slightly developed that it can be readily cleaned out by extending a curette forward along the course of the sinus. I have a number of preparations where the dome of the bulb produced a marked bulging in the floor of the tympanum, and in these cases the bulb could be easily opened and cleaned out from this locality, as has sometimes been recommended. The operation that seems to make it possible always to reach the bulb and effect its exposure is the operation recommended of chiseling away that portion of the temporal bone lying along the anterior margin of the forward extension of the sinus until the bulb is reached. The two dangers in this operation appear to be in the first place, the injuring of the posterior semicircular canal if we

chisel too high, and the cutting off of the facial nerve if too thick a piece of bone is taken off in front of the sinus.

DR. FRANK ALLPORT:—If the thrombus extends back in the direction of the torcular and is solid, many surgeons believe it is the best policy to do very little with it. Accretions to the thrombus extending a considerable distance beyond the original seat of infection may be reasonably supposed to be innocent in their character, and may perhays be safely left alone. Of course, that portion of the thrombus situated near the seat of infection should be curetted and all thrombotic material sufficiently removed in the direction of the torcular to do away with all infective thrombotic material. That portion of the thrombus extending down toward the bulb is, of course, usually infective in its character and can easily be carried by the blood current down into the jugular bulb, internal jugular vein and into the general circulation, thus producing sepsis, pyemia, metastatic foci, etc. This portion of the thrombus should then be completely removed. If an organized clot is found in this portion of the sinus I believe the interests of the patient can be best conserved by packing the sinus wound and immediately proceeding to a complete exposure and removal of the internal jugular vein. After this has been accomplished and the danger of loose, cast off and infective thrombotic materials are in no practical danger of being thrown into the general circulation, we can then go back and complete our operation upon the lower portion of the sigmoid sinus and jugular bulb. I believe that the jugular bulb can be thoroughly cleaned in this way without making use of the Alexander operation, but I am under the impression that the Alexander operation is not being performed much by surgeons doing this character of work. Notwithstanding this, I am glad that Dr. Beck is experimenting with it and that he has given us the honest results of his timely investigations.

DR. A. H. ANDREWS:—I recall a number of cases in which I cleaned out the lateral sinus as best I could with a curved curet, ligated the jugular and cut it off back where it was necessary to check hemorrhage and the patients got well. I felt sure that had I undertaken to clean out the jugular bulb, the patients would not have stood anywhere near the chance of recovery that they would without that formidable procedure.

DR. BECK, closing: I do not believe in leaving an infectious area anywhere near the field of operation, especially when it can be

reached. At least the attempt should be made; when it is anatomically and surgically possible to remove it. When the clot is infected, it should be taken out; if not, it should be left alone. Free bleeding should be obtained behind as well as below; then you are sure that all of the thrombus has been removed. Puncture and drainage of the bulb through the middle ear is possible but should not be advised as a routine procedure.

Tabes with Laryngeal Crises. By OTTO T. FREER, M. D.

DR. FREER presented a patient with tabetic laryngeal crises and paresis of the abductors of the vocal cords, also due to tabes. His report was supplemented by Dr. Stanton R. Friedberg, who had observed the patient in his service at Cook County Hospital. The attacks of crisis varied in frequency from several times a day to once in a few days, and were usually introduced by an aura consisting of abnormal sensations and tickling in the throat. The aura was followed by spasmodic closure of the glottis and a suffocative spell which completely shut off the patient's breath and voice for a period of from one-half to three-quarters of a minute. The spasm of the glottis then relaxed enough to permit labored breathing with stridor, the onset terminating in a coughing spell. Physical examination by the neurologist, Dr. William Healy, showed enough of the signs of tabes to prove its existence beyond doubt, inco-ordination of both upper and lower extremities, Argyll-Robertson pupil, Romberg's symptom and other positive signs being found present.

Laryngeal inspection showed permanent partial adduction of the cords, which did not move outward even during deep inspiration. During quiet breathing they remained abnormally approximated, these conditions were regarded as due to paralysis of the crico-arytænoidei postici muscles.

Dr. Freer, in his comments referred to Sir Felix Semon's classic section on the nervous diseases of the larynx in Heymann's Handbuch der Laryngologie and the great influence it had had in stimulating research in the neurology of the larynx. He regretted that no English version of this superb work of Semon existed. The history of the patient was compared with Semon's description of the crises of tabes and found to be in accord with it, including the paralytic state of the abductors of the cords mentioned by Semon as frequent accompaniments of tabetic laryngeal crises.

Dr. Freer referred to the prevailing impression, gained from the brief articles of textbooks, that paralysis of the crico-arytaenoideus posticus muscle is immediately followed by permanent adduction of

the cord to the median line, that is, the centre of the glottis. He explained that this impression is incorrect and that the only evidence of posticus paralysis, especially in tabes, may for a long time be a slowly developing loss of the faculty of abduction of the cord into the inspiratory position, coinciding with the gradual loss of power of the abductor muscle to finally a state of complete paralysis. Only later, as spastic contracture of the unantagonized adductors develops, is the cord gradually drawn towards the median line, which may never be reached by it, in so slowly progressing an affection as tabes, before the patient dies.

DISCUSSION.

DR. WILLIAM HEALY: This case illustrates the fact that tabes is not only, as the text books say, a disease of the sensory neurone, but also partakes of motor qualities. Perhaps it is worth while to present to you a few figures on the frequency of these laryngeal motor symptoms in tabes. Dr. Harland presented before your Laryngeal Section last year a paper based on his examination of thirty cases of tabes in which he found no instances of crisis or paralysis of the intrinsic muscles, and therefrom drew the conclusion that such symptoms are inordinately rare. As far as my own experience is concerned, I presume that I have seen about two hundred cases of tabes and I must confess that this is the first case with well-marked laryngeal crisis that I have seen. I have looked up the matter somewhat in the literature and have found recorded some 1,270 cases that have been trustworthily examined, and of these four per cent had laryngeal crises. The figures vary, of course, according to different observers; for instance, Starr in 450 cases saw only two per cent, while Graeffner saw ten per cent of crises in 251 cases.

The relationship to the frequency of other crises is a matter of some interest, the most frequent being gastric crises. According to different observers again we find that gastric crises are from five to fifteen times more frequent than laryngeal crises, although the latter are the most frequent next to the stomach trouble. Other crises still more rare are intestinal, rectal, bladder, renal, urethal, testicular, cardiac (simulating angina pectoris), and crises of the clitoris.

The frequency of paralysis of intrinsic muscles of the larynx varies from fourteen to twenty-six per cent of all cases of tabes. The abductors are nearly always affected first, the side affected varying, but the left side being oftenest affected. Gerhardt reports eleven cases of posticus paralysis, five bilateral and three cases in

which all the muscles supplied by the recurrent laryngeal nerve are affected. The paralysis may appear in the very early stage, the preataxic. Semon saw a case in which for two years it was the only symptom of tabes. However, it may not appear until later.

Oppenheim discovered a curious sign, namely, that pressing on the sides of the hyoid bone frequently brings on an attack of laryngeal crises in patients subject to it. Most authors maintain that practically always the Nucleus ambiguous of the eleventh and tenth nerves is affected, but others have not found this to be true; finding the degeneration, rather, in the root fibers running out through the medulla or in the vagus nerve itself. Oppenheim saw one case in which the muscles showed degeneration and none of the nerve fibers nor the nucleus.

The prognosis of the laryngeal troubles of tabes is very bad; rarely paralysis may necessitate an operation. Semon points out that in time paralysis of the adductors takes place and the patient then, with both sets of muscles out of commission, is relieved of all further trouble. He also points out that an operation in such cases is rather dangerous on account of the trophic disturbances which frequently take place in tabes, and he has seen sloughing and failure of the wound to heal after trachectomy. The treatment generally recommended for crises is painting the larynx with a strong solution of cocain and giving bromids and codein internally.

DR. J. HOLINGER: Some authors claim that the treatment of syphilis is responsible for tabes. I would like to ask whether there was a history of syphilis in this case, and what the treatment was; whether there is any connection between these two, the syphilis and the tabes.

DR. FREER: There was no history of syphilis in this case and a careful examination failed to reveal any evidence of syphilis. The lesson to be learned from the case is that laryngologists may be called on to discover nervous diseases through evidences in the larynx, and that all the work done on the innervation of the larynx is German.

Subjective Sensations of Smell and Their Significance. By H. KAHN, M. D.

DISCUSSION.

DR. W. L. BALLENGER: I think that many of the cases reported are not cases of parosmia, inasmuch as the patients had a stinking

substance in the nose which they smelled. Parosmia is a hallucination of smell and not smelling foul secretions in the nose. In antrum suppurations very foul odors are perceived.

DR. HOLINGER: I wish to call attention to the fact that not all cases of parosmia have an organic basis. The usual symptom of a coryza is parosmia. If in such cases the sinuses would be examined carefully, some hint as to the cause of the trouble would be discovered.

DR. WILLIAM HEALY: Beginning with the work of Hughlings Jackson on the uncinate gyrus, neurologists have been especially interested in abnormalities of the sense of smell. An important point is the relation of such abnormalities to epilepsy. Perhaps the physiology can best be explained in the following way. If a minimal electric stimulation is given certain cortical cells in the motor region of the brain, contraction of the muscles supplied from that region will take place, but if a larger current is passed through the electrode the stimulation irradiates from this spot and causes contraction of a greater area of musculature, and with a still greater current a generalized fit may take place on one side of the body and even spread over to the opposite half. Now there has been described a class of fits, the so-called uncinate fits, in which the aura is that of the sense of smell, and it seems probable that the original source of irritation is in the uncinate gyrus and that the overflowing stimulus which causes a generalized fit originates from this source. It is also suggested that many of the so-called hysterical symptoms of the nature of parosmia that Dr. Kahn has just been talking about, may be due to some organic irritation of the uncinate gyrus. On account of what he has just said I would like to send the doctor one of my patients who corresponds somewhat to his description of some cases he has benefitted, and who also corresponds to a very definite type which neurologists frequently see. It is a young woman who thinks that she constantly perceives an odor which she is sure emanates from her body. She has been treated vigorously by a number of good men, especially having had the gastrointestinal tract thoroughly treated. Lately she has been having her nose looked after, but the point that I want to make particularly is that together with her preception, or fancied perception of an odor, she has a complete line of ideas of persecution which altogether makes up a nice picture of paranoia. Now I think that back of it all there may possibly be some organic

disease directly connected with the olfactory organs which accounts for her original beliefs.

DR. KAHN: I gave a clinical classification in my paper. These are subjective symptoms, and if objective proof is found, it becomes an objective symptom. They might be classified as true and pseudo-parosmias; the true being of nervous origin, with no definite organic change, and the pseudo, those in which the cause is concealed. In answer to Dr. Holinger, who does not wish to dig around in the sinuses, I will say it is known that parosmia is only found in diseases of the ethmoid sinus and the antrum of Highmore, the sphenoid and frontal sinuses never causing any such symptoms when diseased.

Technic of Adenectomy and a Perfected Curette.. By F. G. STUBBS, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

DISCUSSION.

DR. E. PYNCHON: I wish to endorse the angle in which the cutting blade is placed. It is the only natural angle whereby one can curette the entire vault. The only criticism that can be made is that the blade is in a straight line. The pharyngeal vault is high and arched, and putting a straight line across it does not enable one to touch all of the surfaces which are rounded; therefore, the blade should be curved. The vault also gets smaller toward the top, hence a straight knife cannot go clear up to the top.

Some ten years ago I designed an adenoid curette, the upper cutting blade of which was placed at the same angle employed by Dr. Stubbs. This upper blade was also curved for the reasons given. Furthermore, this curette was provided with side cutting blades, so the fossae of Rosenmueller could be curetted. It was made for me by Truax, Greene & Co., and its description was published in the Annals of Otology, Rhinology and Laryngology, February, 1900.

DR. W. L. BALLENGER: I wish to call attention to the anomalous formations of the pharyngeal vault, and it is obvious that not many curettes will meet all these conditions and remove the tissue. I think that Dr. Stubbs' curette is one of the best, but the curette Dr. Pynchon designed some years ago with a backward sweep of the blade would be successful where Dr. Stubbs' curette would fail.

DR. HENRY GRADLE: I think that the curette is correctly designed and that it is applicable to the slight variations of the pharynx

met with in practice, and that with moderate skill and some practice the mass can be brought out in one piece with one sweep. But it presupposes some practice and skill, and to minimize that I designed the automatic guillotine. It is very similar in curve and form to the Stubbs' curette. The knife of the guillotine does break once in a while, but only in one place; but all that is necessary is to put in a new knife. The particular advantage of the guillotine is that it adapts itself automatically to the shape of the pharynx, and if the operator remembers to push it up firmly enough, sliding along the posterior edge of the vomer, he cannot fail to bring out the mass, even with little skill. But with more skill, Dr. Stubbs' curette will accomplish the same purpose as thoroughly and as satisfactorily.

DR. JOS. C. BECK: I use the Barnhill curette and have no trouble in getting out the adenoids in one mass. One might have trouble with Dr. Stubbs' curette in cases where there is a deformity of the wall of the pharynx or a protusion of the atlas, and extreme care would have to be used in making the forward and upward sweep not to cut the mucous membrane. The greatest trouble the average practitioner has is to sweep downward. I have modified the guillotine by making the blade work upward, thus preventing a breakage. I use a solid blade, devised by La Force, and it does the work very nicely.

DR. F. G. STUBBS, closing: It is true that no single instrument can be made that will fit all cases, but I believe that this one will in the great majority. The reason that I made the knife blade nearly straight on its upper surface was that I found it would gouge too deeply in the median line, in many cases, if it had much curve.

What Dr. Gradle claims for his adenotome is true, yet it also is true that it cannot adapt itself to varying shapes of the vault as can the curette. Further, as one should use as large an instrument as will fit into the vault, at least three sizes are needed and this makes a very expensive outfit.

Replying to Dr. Beck, I would say that my curette differs from Dr. Barnhill's in that the supporting sides recede directly from the knife, while the knife is straighter, flatter and much narrower, apparently small differences and yet essential to a complete removal. And this complete removal should be done with only one sweep of the curette.

THE AMERICAN LARYNGOLOGICAL ASSOCIATON.

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A. W. DeROALDES, M. D., President.

(*Continued from the April Number, page* 334.)

DISCUSSION OF DR. GOODALE'S PAPER (CONT.)

DR. JOHN W. MACKENZIE: Dr. Austin Flint was once conducting an examination in physiology, and asked one of the men that came up to be examined: "What is the function of the spleen?" He replied: "The function of the spleen is to enlarge in malarial fever." The next student was asked: "What is the function of the tonsil?" He said: "To enlarge and suppurate." Dr. Flint said: "You have a perfect mark, for you know as much about it as I do." A distinguished medical luminary across the Atlantic once said that if he were going to construct a Frankenstein, he would make it without the tonsils. At a meeting in New York, a distinguished ex-President of this Association reported a number of cases of tonsillotomy; and some inquisitive, incredulous individual, with a mathematical turn of mind, calculated that he must have taken out a bushel a day to have done so many in an ordinary lifetime.

This general massacre of the tonsils that obtained in the early days of laryngology received a rude jolt when, in the early part of the last century, it was proclaimed that the tonsil had a direct relation to the virility of the male. This luminous doctrine owed its popularity to Chassaignac. According to this proposition, impairment of the tonsil or its extirpation produced impairment of the sexual function. This made the excision of the organ unpopular. When it had been found out that there was nothing in this theory, the work of massacre of the tonsils went merrily on again. Never in the history of mankind has the lust for tonsil operation reached its zenith, however, until now. Not only the profession, but even the laity, are infected with the idea. I frequently have patients say, before I have even looked at their throats: "Doctor, don't you think my tonsils should be removed?"

On the other hand, I was consulted a few weeks ago, by a lady past middle age, who had some concretions in the crypts of one of the tonsils. She did not wait for me to give an opinion, but said:

"I want it distinctly understood in the beginning, that my tonsils are not coming out. I have carried them for sixty odd years; and, though they have given me trouble at times, they have not interfered with my general health, and I mean to keep them." I replied: "Madam, the logic of your position is irresistible, and I will respect your wishes."

In regard to the question of the tonsils as portals of inspection, of course there is no denying the fact that they are very frequently the avenues by which acute arthritis or acute endocarditis and other diseases enter the system; but the subject has been very much exaggerated. It is curious to note historically that the relation of tonsilitis and acute inflammatory infections of the throat and the nasal passages to rheumatism has been recognized since early times. Pliny repeatedly uses the terms fluxor and rheumor as synonymous. The association between these two sets of phenomena has engaged the attention of such men as Hoffmann, Venable, Curtis, Sydenham, etc. Kauffman regarded catarrh as rheumatism of the mucous membrane.

I am thoroughly delighted with the beautiful work of Dr. Goodale. He has pointed out with great lucidity the purely bacteriological side of the question. There is another side, however; the purely clinical one. If we follow the pure bacteriologist to the extreme limit, there is no telling where we shall be landed. When we consider that the tonsillar region and naso-pharynx is the lounging-place, the club-house, of pathogenic bacteria, why do we not have more sepsis in the thousands of cases in which operations have been performed on this region? It therefore seems to me that if we follow this proposition to its logical end, nothing short of the guillotine will give the patient absolute immunity.

From the purely clinical standpoint, I think that these total tonsillotomies are absolutely unnecessary and frequently harmful. It is a question whether the shock and danger, and the inconvenience and uncertainty, of the method of complete tonsillotomy, the chief objection to which is that it cannot be made complete, do not nullify any good that may be expected to arise from it. When the bad result and the accidents met with in this operation are contrasted with the amount of exact, certain good accomplished, I doubt whether, in a great many cases, one is justified in undertaking such extensive work.

Let us not be misunderstood. I have been taking tonsils out for a quarter of a century, and hope to do so for many years to

come. My contention is simply this: In considering these operations, one should be guided by a safe, sane, conservatism and common sense, and not be carried away by those that, by their precepts and example, would have us believe that the tonsil was not put into the throat by God, but by the Devil.

DR. GOODALE, closing the discussion: I wish to say that examination of the faucial structure of cattle and of ordinary swine, shows the presence of an aggregation of lymphoid elements, not different from the structures that we find in normal children. When children come to us for the removal of adenoids, we remove the tonsils in order to prevent the subsequent occurrence of enlargement of the tonsils, and to make the operation more complete. Examination of these normal tonsils shows that they are indistinguishable from the tonsils of the pig. The pig resembles the human animal more nearly than does any other in the histological structure of its different tissues. A study of the human animal shows that shortly after birth there is an invagination of the epithelium. This may be found in every individual, so far as I know. Around that invagination there gather the follicles. These are aggregations of lymphoid cells. As the child increases in size, the crypts of the tonsils are formed. These are present in a normal child three or four years old. I cannot, therefore, agree with Dr. Bosworth that the tonsil is not a normal structure of a normal human body. When it is enlarged, this is caused by the absorption of toxins or the penetration of toxins formed in other situations; as in scarlet fever, mumps, typhoid fever, etc. The reason that a normal tonsil reaches a condition of hypertrophy is that various toxins—formed either in the throat, from bad condition of the teeth, etc., or as the result of a more general distribution of toxins throughout the body—penetrate its substance.

Dr. Casselberry spoke of the importance that the chain of lymph-follicles behind the posterior pillar has in infectious arthritis. That is a point that has recently become more conspicuous in my mind. I shall probably speak more about it in the future. In our examinations of the throats of patients, we always find a certain number presenting this common hypertrophy of the posterior chain. If one asks such a patient whether he has had rheumatism, he will probably say, "Yes." An examination made during an acute attack of arthritis will show either enlargement of the tonsils or enlargement of the bronchial follicles, with inflammation.

In regard to total extirpation of the tonsils, I think that if one is willing to do a very thorough operation, the tonsils can be entirely

removed. This cannot, however, be done well with cutting instruments. The only safe procedure for these deeply buried tonsils is first to remove what can be gotten out of that portion which protrudes into the mouth; and then, with a deep holder of some sort, to get into the interior of the tonsil until the capsule is reached. Then seize the capsule and invert the whole thing, first freeing it from the pillars with whatever instrument you wish. My experience has shown that the only way to remove deeply buried tonsils is to seize the capsule. After it has once been everted, it is surprising to see what a shape it assumes. Let the snare then fall over your original holder, and repeat the process of eversion. After this has been done, lock the snare and cut the thing down. Careful examination of the capsule will now show a complete excision.

This is a serious operation. There are few patients upon whom I should wish to do it. There is a great deal of soreness for two or three weeks after it has been done.

This brings us to a consideration of the circumstances in which it is necessary. Operations on the tonsils should be done for two purposes: For obstruction, when the tonsil interferes with the circulation in the vicinity, or has an unfavorable influence upon the Eustachian tube; and for absorption. The methods in each of these conditions are distinct. In operating upon a child for obstruction, one can content one's self with doing a simple operation; and when the child reaches the age of puberty, there will be involution of the remaining portion. That is the ordinary operation. There are relatively few cases in which complete tonsillotomy should be done. These may be grouped, more particularly, under the conditions of infectious arthritis, recurrent endocarditis, and infection of the cervical lymph-glands. The first two of these conditions may be very serious menaces to the individual. It may be a question whether he will die, or be an invalid for his remaining years. With proper treatment, he may be made comfortable for many years to come. With these I shall group a third condition of cervical adenitis, supposed to be from tuberculosis. Cervical adenitis may be the result of toxins generated in the crypts of the tonsil. In this condition, the diagnosis is confirmed if, after removal, the swelling goes down. The other cases are penetration of tubercle bacilli into the tonsil through the glands of the neck. In such cases, removal of the tonsil will not influence the glands. What should be done in these conditions? A direct answer to that question is found in our results. If a child were brought to me with

enlargement of the glands of the neck, I should recommend the complete excision of the tonsils before doing anything to the gland, unless the glands were in danger of breaking down. If the organisms have only made their way through the crypts of the tonsil into the glands of the neck, and you merely remove the glands, what is to prevent the production of fresh infection? Remove the tonsils as completely as possible; then either do the operation on the glands yourself, or turn the case over to the general surgeon.

Demonstration of New Instruments for Bronchoscopy and Oesophagoscopy. By Prof. GUSTAV KILLIAN.

Five new tubes were shown, varying more in length than the older models, being both longer and shorter. A tube spatula, through which a smaller inner tube could be introduced or removed easily made it possible to substitute tubes of longer or shorter length without repeating the difficult first stage of introducing the tube.

New tubular forceps, being adjustable to varying lengths of tubes, and a new lamp firmly attached to the handle of the tube, were presented and explained.

DISCUSSION.

DR. H. P. MOSHER: I cannot express how fortunate I think the society is in seeing these instruments. I have had a fairly extended chance to work with them, and two points occur to me that I should like to have Prof. Killian clear up; I hope the elucidation of them will not prove tiresome to you.

He said that the nearer one gets to the foreign body with the tube, the better will be the result. Why not say, "The nearer one gets to the foreign body with the light?" I used to work with the light at the end of the tube, as near to the foreign body as it could be brought. Why has this been given up? So far as I can tell, especially from work on the cadaver, the light at the end of the tube, in the form of the endoscope, gives much better results than does the light on the forehead, or the light as demonstrated.

As to the extension tubes, that is an extremely beautiful idea mechanically. I noticed the other day that Prof. Killian had to put his suction tube inside the main tube to remove the mucus. With the plain, straight, solid tube, with a light at the end and a smaller tube set into the side of this tube to remove the mucus, it is not necessary

to introduce a tube for this purpose. The tube made by Jackson admits of withdrawing the mucus while operating, and thus saves time.

Thirdly, it is of great importance to know how many cases require an emergency tracheotomy after the manipulation of passing tubes through the cords. If we could all do the operation as Prof. Killian did it in New York, there would be little call for an emergency tracheotomy, but we cannot do that. I am afraid that in our first attempts we shall cause a certain amount of trauma; and if we do so, we are running the danger of emergency tracheotomies. There have been some necessary in this country; have there been any in the German clinics?

DR. E. FLETCHER INGALS: I wish to ask how the forceps is taken apart. I have had a good deal of trouble in this way.

Referring to what the last speaker said about the advantage of having the light at the end of the tube, I would state that in my practice, the light is sometimes better at the distal end, and sometimes at the proximal. I have in mind one case in which the light at the lower part of the tube caused a reflection that appeared like an extra ring. It came from the lower part of the tube. I have never obtained this reflection with the light at the proximal end. It caused a great deal of annoyance, and was probably the reason for the failure in the case. The child had swallowed—or, rather, inhaled—the head of a lead-pencil—a small bit of brass with the lead-pencil in it. I felt that the pencil must have been removed and that what I saw was the brass; and my assistants were still more certain that this was the case. The pencil was there yet, however; but it was in the other bronchus. The reflection has deceived me a great many other times, though it did not result in failure.

The light at the distal end does not always work well, no matter how bright it is. I should think that Dr. Jackson's instrument would cause a good deal of difficulty. The blood or mucus blurs the light, and cannot be cleaned off; and it does not seem practicable to take the tube out and introduce it again. I have used the light within the tube, but not this kind.

As to the suction-tube outside the bronchoscope proper, you want all the room inside that you can get; and the suction-tube outside is only another tube liable to be blocked. Suppose that very thick mucus and blood block it. I have had mine become blocked so that I could not use them at all. They were tubes introduced into the

bronchoscope itself. It seems to me that it is better to have an instrument inside that you can withdraw; because the withdrawing is a quick process, and you can work with a larger tube. The larger the tube, the better the lighting; and with little children you cannot get a large tube in. With adults, also, when working beyond the first or second division of the bronchi, one has to use a very small tube.

On the whole, I think Prof. Killian's instruments are as nearly perfect as they could be. The watch-spring would not be in the way, but I should like to know how it is cleaned and oiled.

DR. E. MAYER: I agree fully with the statements made by Dr. Ingals, that there is an objection to the light at the other end of the tube. Very frequently a small amount of blood will show itself on the mirror, and one has to stop until the mirror has been cleaned off again; especially as we may not be able to see the foreign body so quickly as Prof. Killian could.

The newer instrument is, I think, of very great value, and a great improvement upon the older one, in that the light is held in the hand. The head-mirror becomes hot within a short time and one has to stop and allow the instrument to cool off.

Reference has been made to the cadaver. To work with the cadaver is about as useless a method of practicing bronchoscopy as I know of. It is far better to take a dog. This comes much nearer to the actual work, and is easily done without annoyance to the animal. An injection of a grain of morphia makes it quiet; and the introduction of the instrument into the larynx, trachea, or bronchus becomes an easy matter indeed. One has then the same conditions that exist in the human being—the hot air in the face, the mucus, and the little blood. The newer instrument, in that it is less clumsy, is going to be a valuable addition to our armamentarium in this work. I feel that we owe a great debt to Prof. Killian for the advance in our armamentarium.

PROF. KILLIAN, closing: I think that the questions have all been answered. I have only to say that most of the cases of foreign bodies are in children, whose tubes are very small. The diameter of an electric lamp must be three millimeters at least, and the mirror in the tubes will obstruct most of the tubes in such cases.

I have found 116 cases of tracheotomy after bronchoscopy. In these cases, the extraction was difficult; and it was necessary to have the tube remain a long time in the larynx, and to introduce

it several times. Personally, I have never had a case of tracheotomy after laryngoscopy. I am very careful; and the gentlemen, my colleagues, that have seen me do this operation have been assured that I did not make a trauma. If you have a good situation for the instruments, it is not necessary to make a tracheotomy subsequently. This becomes necessary only if it is not possible to remove the foreign body through the larynx. Then tracheotomy must be performed, and also lower bronchoscopy.

DR. MAYER: What age is too young for direct bronchoscopy to be performed?

PROF. KILLIAN: The youngest child upon whom the operation was performed at Munich was eight months old.

Modern Procedures in Excision of Intrinsic Maligant Growths of the Larynx. By SOLIS-COHEN, M. D.

(*Published in full in* THE LARYNGOSCOPE, *May*, 1907, *page* 365.)

Non-Recurrent Carcinoma of the Larynx Removed from the Natural Passages. By E. FLETCHER INGALS, M. D.

(*Published in full in* THE LARYNGOSCOPE, *May*, 1907, *page* 370.)

Report of a Case of Epithelioma of the Larynx. Removal by Thyrotomy and no Recurrence after Three and One-Half Years. By HENRY L. SWAIN, M. D.

(*Published in full in* THE LARYNGOSCOPE, *September*, 1907, *page* 693.)

DISCUSSION OF PAPERS BY DRS. SOLIS-COHEN, INGALS AND SWAIN.

DR. INGALS: Dr. Cohen spoke of using cocaine and adrenalin in removing growths from the larynx. I do not see any reason why the adrenalin and the cocaine should not be put together, so as to save some of the mopping. In early days, I had a good many cases with disagreeable constitutional symptoms; and I have been greatly surprised at the amount of cocaine used by some of my colleagues without producing these disagreeable symptoms. One of them used an adrenalin solution 1:1000, in which he dips his mop; then he puts the mop into the crystals of cocaine, and applies it freely to the nose of even little children. He has never had disagreeable constitutional symptoms follow this procedure. Within the last year or two, I have used this, putting in enough cocaine to make a twenty per cent solution. I suppose the adrenalin prevents the absorption of the cocaine, and thus prevents the constitutional effects.

Dr. Cohen also spoke of mopping the wound with the compound tincture of benzoin. It seems to me that this is improved by putting in an excess of the gum benzoin, two drams to the ounce. This makes a film that will last considerably longer than will the compound tincture alone.

DR. HUBBARD: I have observed that in etherized patients adrenalin does not produce local ischemia—at least, in the nose. I have noticed this several times. Whether it is merely a coincidence or was due to some fault in the solution I was using (although this was freshly prepared); or whether there is some physiological antagonism between ether and adrenalin, I do not know. I put the question to the manufacturers, and they said that they would investigate the matter. I should like to know whether others have observed the same thing. I have not made the same observation with reference to chloroform.

DR. CLARK: I should like to know whether a microscopic examination was made of the growth after its removal. I think Dr. Cohen's method of operation gives valuable suggestions regarding the mode of procedure in these cases.

I also want to report the present condition of a patient of mine with cancer of the larynx, operated on ten years ago. He was then fifty-nine years of age. The growth was removed by thyroidotomy. The larynx was split and the soft tissue on one side of the larynx thoroughly removed, and he made an uneventful recovery. The case was reported two years afterward and the article was published in the Boston Medical and Surgical Journal. The diagnosis was epidermoid cancer. I have a letter from the patient which I received just before leaving home. In this he says that he is now seventy years old. His general health is good and his voice is quite strong, although not so strong as before the operation. His friends notice no difference in it in conversation. I wish to put on record this case, in which the patient is well ten years after the operation.

DR. GORDON KING: In the case of a patient of mine operated on two years ago for an epithelioma about the size of a small coat-button, just above the vocal cord, we had to do a preliminary tracheotomy and then a thyrotomy. He is an enormous man, weighing two hundred and eighty pounds. The growth was removed down to the cartilage; and then Dr. Swain's method was pursued. The man is a lawyer, and was very much concerned about the probable

effect of the operation upon his voice. I felt a little uneasy about it myself. The larynx now shows scarcely a trace of the operation, and the patient's voice is perfectly preserved. We removed about half of the vocal cord, cutting right down to the cartilage. The cord has been re-formed, and the mobility of the cord is preserved. He says that his voice is even better than before the operation.

DR. MYLES: I believe that there is something individual in these cases of epithelioma of the larynx. At the meeting of the American Congress held two years ago, I reported a case in which I had removed a tumor from the larynx near the vocal process about a year previously. It was found to be an epithelioma. I asked the patient whether he wished me to do an external operation, and he said he did not. I saw him about three months ago, and found that he has had no trouble since. I do not believe that this growth was a true epithelioma of the type that penetrates deeply, although the pathological demonstration showed it to be so. I do not think that a cancer of the deeply penetrating type can be cured. The one removed in this case was probably similar to the kind of epithelioma that sometimes grows around the eye. Oculists remove a great many of these from the eyelids, and the patients recover.

DR. DELAVAN: I have with me a letter from an old patient bearing upon this point. It may interest you to know what he says. The patient was a man of thirty-five years ten years ago, when he came to me for a small growth on the right side of the larynx near the right ventricle, which was diagnosed by one, at least, of the very best men in New York City as a papilloma. I was advised to remove it. It did not seem to me, however, to be a simple papilloma. I had the patient operated upon, two-thirds of the larynx being removed. When we split the larynx open, we found the nodule to be but a small expression of the whole disease. More than half of the cartilages had to be extirpated. The patient was a man in the prime of life—strong, brave, good-natured, and with no complicating conditions. He made a brilliant recovery. I have received from him this letter, which I will read because I think that we do not consider enough, in this or in any other direction, the ultimate condition of patients operated upon, no matter for what trouble. It is important to look ahead and try to read the future of such cases.

He says he has been working as hard as he knows how to hold his position, which is that of a salesman in a large cloth-house. He

is struggling against great odds, as he is always very tired when his work is done. He feels, however, that he must keep working away, as the only thing he knows how to do is to sell goods. From the character of the man, I know that this is a tremendous confession for him to make. About four weeks ago, he was taken sick. A cold settled in his throat, and his voice was gone. As soon as he was able, he went to Toledo, Ohio, to consult a throat specialist, who, the man was glad to find, was an old acquaintance of my own.

The history of this case is as favorable as possible. It is, however, not so favorable as would have been the result of thyrotomy of any of the cartilages or their parts; but, on the whole, the conditions were exceedingly good. I bring the case up to call attention to a paper read, not long ago, by the gentleman who operated on this case, Dr. Curtis, on the impossibility of curing cancer. He has been a leading surgeon for twenty years, and has been as conscientious and as earnest an advocate of operative procedures as any man here present. Although he brings up nothing new, he sums up the general opinion that cancer does not admit of cure, and that we cannot expect it to do so. An operation sometimes palliates; but to talk of its curing is almost to beg the question. The time-limit arbitrarily set upon cases, whereby, for instance, it is said that a case that has been free from recurrence for such a length of time must be considered as cured, is not to be relied upon. An epithelioma of the edge of the epiglottis constitutes one of the most favorable cases. I had always thought that this patient's case was rather favorable; but in this case, in which, of all others, one would expect that a cure would be effected by removal, I believe that now, at the end of four years, recurrence is taking place. When we place the time-limit at three years, therefore, we are in error. Operations for this trouble have been discussed and thrashed over for years, yet no better presentation of the correct technique could be given at the present moment than the one given by Prof. Cohen. Under this method of procedure we are likely to obtain the best results; but the whole gist of my remarks leads up to this: That all methods are hopeless and are disappointing in the main. We cannot, therefore, too strenuously urge haste upon those trying to discover some cure for cancer. The history of cancer of the larynx is typical of cancer throughout the body, though it is a little more dreadful than the same disease as found in some other parts. I believe that each one of us would be doing right in stimulating those

engaged in this investigating work to use all possible earnestness in hastening the advance that we feel sure will ere long put surgery out of this field entirely.

DR. MOSHER: I should like to speak briefly of a case in my experience. We may not cure, but we can relieve; and that relief is often obtained in even very extreme cases.

The case I refer to was one of most desperate type admitted recently to the Massachusetts General Hospital. An emergency tracheotomy was done to relieve the patient from immediate danger. Then, when the diagnosis had been ascertained, the case came to operation. The growth was found to be extremely extensive; and when the operation was over, the whole of the larynx and the anterior wall of the esophagus had been removed, and I had gone as far as the suprasternal notch. It did not seem to be worth while when doing it, and I was surprised to find afterwards that it had been. This young man was practically asphyxiated, and within a few weeks would have starved to death; but he was made comfortable, and is so now. There is a recurrence, but the disease is in the chest, and a secondary operation may be done for that. This man was not in poor circumstances. He was a man of some social importance, and his experience for six months more meant everything to the corporation to which he belongs; and it certainly seemed worth while to give him that six months.

DR. COHEN, closing: With all the rest, I congratulate Dr. Ingals on the success of his case of intralaryngeal removal. He mentioned, in the report of his case, that his patient did not get better until after an attack of influenza. I have seen a number of patients with malignant disease of the throat get well after influenza, as also after an attack of erysipelas.

As to mopping with cocaine and adrenalin together, I have no doubt that it would do just as well; but the cocaine in my case was intended to get rid of the reflex of the larynx. As I used 1:1000 adrenalin, its use was confined to the immediate region of the growth.

The reason I used compound tincture of benzoin, although I usually prefer acid nitrate of mercury as a caustic, is that in this case I had removed the perichondrium. I was afraid that if I applied an escarotic I should do injury. I thank the doctor for his suggestion of adding the benzoin, for I have no doubt that it will make better lasting varnish. I almost always give a general anes-

thetic, unless the physician is much opposed to it, I use chloroform. I have no experience in the use of adrenalin in cases under ether anesthesia.

DR. SWAIN, closing: First, as regards adrenalin and ether there is an antagonism between the action of ether and the paralysis of the control of these motor nerves that the adrenalin makes by contraction of the vessel wall.

In answer to Dr. Clark's question, I would say that the case was positively epithelioma. When we took it out in sections, we could see the penetrating form of the growth. I omitted the microscopical examination, in order to make my report briefer.

Dr. Myles says that there are various kinds of epithelioma. There are varying degrees of malignancy in every kind of tumor.

In answer to Dr. Delavan, it was for that same reason that I related my case. With so much said against operations for cancer of the larynx, and so much evidently bad in our prognosis in such cases, here was an instance in which the sunny side came out; and we ought to bring that side into contrast with the shady picture brought up by Dr. Delavan. In some cases we can cure, however. We have got to do it by surgery; and when we do not possess any method except surgery, let us make this accomplish as much as possible.

[*(Proceedings of the American Laryngological Association to be Continued.)*]

Primary Perforating Epithelioma of the Velum Palati. Dr. GHAUFFARD. *La Presse Med.*, Mar. 27, 1907.

The patient's attention was first attracted by a slight pharyngeal annoyance during deglutition, and occasional pains in the ears; shortly afterwards there was a perforation of the velum palati as shown by the regurgitation of liquids through the nostrils.

On examination, there was found a tumor composed of a large infiltrated mass, ulcerated, bleeding easily, giving an offensive odor; there was a long antero-posterior perforation, surrounded by a border of grayish white spots resembling tubercles.

The diagnosis of the neoplasm, made in spite of its rarity, was confirmed by the histologic examination. SCHEPPEGRELL.